

STATUS OF POLLUTION ABATEMENT
IN ONTARIO'S
PULP AND PAPER INDUSTRY

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ONTARIO
MINISTRY OF THE ENVIRONMENT
NOVEMBER, 1984

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HAZARDOUS CONTAMINANTS
AND STANDARDS BRANCH
135 ST. CLAIR AVENUE WEST
TORONTO, ONTARIO M4V 1P5

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1984

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PREFACE

This report is a supporting document to the Ministry's report "Environmental Control and Monitoring Requirements for the Ontario Pulp and Paper Industry".

Information available to the Ministry regional offices has been gathered on air emissions, effluent discharges, and landfill operations for the pulp and paper industry. Significant progress has been made in pollution abatement by the industry to meet the requirements set out in Ministry Control Orders. Gross pollution from this industry is being brought under control, however, the remaining problem areas require further improvement.

The recommendations contained in the above-mentioned report are discussed and related to the current status of the various pulp and paper mills in Ontario. Recent data from 1982 and the first half of 1983 has been used in the preparation of this report.

The recommendations are presented as a baseline to be met by all industries by approximately 1990. In some cases, the recommendations have been included in the report to prevent future problems and to assist Ministry of the Environment staff in preparing Control Orders. It should be recognized that some mills may not be able to meet certain recommendations due to specific local conditions and economic factors specific to each mill.

Table 7 contains a summary of the current status of mills in Ontario with respect to the recommendations contained in "Environmental Control and Monitoring Requirements for the Ontario Pulp and Paper Industry".

STATUS OF AIR EMISSIONS

MILL EMISSION INVENTORY

All pulp and paper mills shall:

- i. complete and submit a report on a survey to identify and measure all known and suspected sources of odours, sulphur dioxide, nitrogen oxides, total reduced sulphur and particulate matter; and
- ii. install devices or otherwise control the emission of the above contaminants to comply with Regulation 308, of the Environmental Protection Act;
- iii. The terms of reference for the survey must receive prior approval from the Regional Director.
- iv. Those mills with emissions in excess of Regulation 308 limits will update the survey information on a three-year cycle.

Since the Ministry has very little data available on air emissions from the pulp and paper mills, the quantitative reduction in pollutants discharged to the air, due to the installation of new or modified equipment, cannot be reported. To assess the significance of these improvements and to provide a basis for further improvement of air quality, emission measurements are needed.

At eight paper mills in the province, emission surveys may not be required due to the fact that no chemical pulping takes place and most power boilers at these mills are fired by natural gas. At the seven locations listed below complete or partial emission inventories have been completed in recent years:

James River Marathon (American Can of Canada Ltd.)

Kimberly-Clark of Canada Limited, Terrace Bay

Great Lakes Forest Products Limited, Thunder Bay (kraft and

sulphite mills)

Ontario Paper Company Limited, Thorold

Domtar Fine Papers Limited, Cornwall

Abitibi-Price Limited, Smooth Rock Falls

Boise Cascade Canada Ltd., Fort Frances

While measurements of particulate and odourous compounds are being made, two other pollutants, SO_2 and NO_x , should be measured. These measurements would replace the theoretical values which have been used in air model calculations by the Ministry in past years.

The actual measured emission rates should be used in dispersion calculations using a multi-stack model to verify that the half hour impingement concentrations of particulate, total reduced sulphur compounds, hydrogen sulphide, mercaptan, nitrogen oxides, and sulphur dioxide are not exceeded. The installation of additional abatement equipment or process changes will be required in those cases where a calculated exceedance of the maximum ground level limits contained in Regulation 308 are found.

The data presented in the tables of this report illustrate the fact that many changes have taken place in the pulp and paper industry in Ontario. Production has increased by 13 percent or 1,593 tonnes/day between 1970 and 1982. Process changes have been made at nine mills and product changes at two mills in the same time period. Regular surveys of major sources of air emissions not meeting the requirements of Regulation 308 are required on a three-year cycle if the Ministry is to be kept up-to-date.

AMBIENT AIR MONITORING AND TELEMETERING (reference Table 3)

Ambient air monitors shall be installed and operated in municipalities where pulp and paper mills emit amounts of particulate matter, TRS, or SO_2 in excess of Regulation 308 or at levels that give rise to public complaints. Telemetry equipment shall be installed by the company to transmit the data from these monitors directly to the mill.

Seventeen mill locations using chemical pulping or burning solid fuel may be affected by this recommendation. The Ministry has ten ambient air monitors that continuously monitor total reduced sulphur compounds or SO_2 . These monitors are located in the following communities:

- Fort Frances - Boise Cascade
- Kenora - Boise Cascade
- Dryden - Great Lakes Forest Products
- Thunder Bay - Great Lakes Forest Products
 - Abitibi-Price, Fort William Division
- Marathon - James River Marathon Limited
- Red Rock - Domtar Packaging Ltd.
- Terrace Bay - Kimberly-Clark Canada Ltd.
- Cornwall - Domtar Fine Papers
- Espanola - E. B. Eddy
- Smooth Rock Falls - Abitibi-Price Inc.

Several mills are already telemetering ambient air monitoring data back to their mills to be used to assist in the operation of recovery boilers. These companies are:

- Domtar Fine Papers Limited, Cornwall
- Domtar Packaging Limited, Red Rock
- Boise Cascade Canada, Fort Frances
- Kimberly-Clark of Canada Limited, Terrace Bay

E. B. Eddy Forest Products Limited of Espanola are currently installing an ambient TRS monitor which is to be located in the Town of Espanola. The data from this monitor will be telemetered to the recovery boiler control room at the mill. This will allow the mill to take action to reduce the ambient air level should exceedances of TRS in the town occur.

The Air Resources Branch of the Ministry of the Environment is currently investigating a telemetry system that will make all Ministry-operated ambient air monitoring data readily available to regional staff. This will enable Ministry staff to investigate upsets, etc. on a real time basis.

Industry has been encouraged to telemeter ambient readings into their control rooms. This will enable operators to adjust process conditions to keep ambient concentrations at the monitor at a minimum and when concentrations exceed Regulation 308 limits to take steps bring the emissions back under control.

CONTINUOUS SOURCE MONITORING (Reference Table 2)

Continuous monitoring devices to measure selected contaminants shall be installed on all major emission sources, such as power and recovery boilers, and lime kilns.

TRS compounds are continuously monitored in kraft mill recovery furnace stacks at the following mills:

Great Lakes Forest Products Limited, Thunder Bay - two recovery furnaces monitored (by titrators)

Great Lakes Forest Products Limited, Dryden

Abitibi-Price Limited, Smooth Rock Falls

Domtar Fine Papers Limited, Cornwall - recovery furnace and Copeland Reactor (by titrators)

Kimberly-Clark of Canada Limited, Terrace Bay

In general, titrators have been found to be labour intensive and unreliable. Newer electronic monitors are proving to provide good service and reliable results. In both cases, only concentration values are provided as opposed to mass emission rates. However, information from these instruments readily indicates the change in the emission rate. The other three recovery furnaces operated in the province should be monitored continuously. As knowledge about how operating conditions affect emissions accumulates, a correlation between emission rate and complaints can be developed. Some mills in the province are occasionally sampling major emission sources for some parameters but this does not provide sufficient data to correlate emissions with exceedances of Regulation 308 limits.

Although lime kilns can be significant sources of TRS, due to high moisture content and the corrosivity of the flue gases, effective operation of continuous monitors in these conditions is difficult. Grab sampling of the flue gases for analysis can be used in these situations if sufficient samples are collected on a regular basis.

Particulate emissions are monitored by opacity meters. Opacity meters are presently used in six Ontario mills. The data from these meters is used mainly for process or boiler control, as opposed to an environmental monitoring tool.

Many changes and improvements have been made to reduce air emissions. The equipment that has been installed must be maintained and operated properly if Regulation 308 limits are to be achieved. After the various continuous monitors are installed, their measurements will confirm the current emission levels from these sources. Both the company and the Ministry will be alerted to the need for equipment maintenance or process upsets whenever emission increases are detected. In these instances, the company will be expected to take the appropriate action.

REPORTING (Reference Table IV)

All mills that are required to install continuous emission monitors on major emission sources shall maintain all recording charts on file for a period of two years and submit a monthly report to the Ministry to include:

- i. the maximum, minimum and average concentration of emissions from the source monitored for each working day; and
- ii. the concentration, range, and duration of excursions above stack emission levels as established by the Ministry on a site specific basis.

Currently, only one company is routinely reporting levels of air emissions. Domtar Fine Papers Limited in Cornwall submits a monthly air emission report on TRS. The concentration graphs for the Copeland reactor and the recovery boiler, which show the TRS emission levels, are submitted to the Ministry's District Office. The company makes an attempt to explain high levels of discharge.

FUGITIVE SOURCES (Reference Tables 1 and IV)

All mills shall identify areas of actual or potential concern with respect to fugitive emissions. Sources of particulate matter and odorous compounds may require site-specific abatement measures.

While most major pollutant point sources are coming under control, the remaining sources, which are usually low level, low concentration, high volume sources, will become more noticeable. The aggregate of all such emission sources must be evaluated using a multi-stack model, and, wherever possible, actual measurements of the emissions should be used in the model. In some cases, this will highlight situations where the aggregate discharges will not meet Regulation 308 limits and additional abatement will be required.

This has been illustrated by the Ministry of the Environment's experience at the following mills:

- James River Marathon Inc., Marathon
- Domtar Fine Papers Limited, Cornwall
- Domtar Packaging Limited, Red Rock
- E. B. Eddy Limited, Espanola
- Abitibi-Price Inc., Smooth Rock Falls
- Boise Cascade Canada Ltd., Fort Frances
- Great Lakes Forest Products Ltd., Thunder Bay
- Kimberly-Clark Canada Ltd., Fort Frances

STATUS OF WASTEWATER DISCHARGES

SUSPENDED SOLIDS AND BOD (Reference Table 2)

Ontario's pulp and paper mills first made in-mill changes to reduce suspended solids. Finally, add-on equipment such as clarifiers and lagoons were installed. The suspended solids reduction between 1970 and projected to 1984 are as follows:

Year	1970	1982	1984
Tonnes per day	451	119	105

The 1984 total is based on Control Order requirements. By 1982, several mills were already below their 1984 limit and in Table 4, the Control Order limits have been used to calculate the 1984 discharge.

The discharge of dissolved organics as measured by the BOD₅ test has decreased over the years as listed below:

Year	1970	1982	1984
Tonnes per day	768	477	319

This reduction has been accomplished by the closure of some sulphite mills for economic and environmental reasons, tightening up paper making operations, the installation of eight condensate strippers and the installation and operation of six secondary treatment processes. The 1984 figures reflect the full effect of the six secondary treatment systems to meet Control Order requirements. These mills are:

Boise Cascade, Fort Frances
Fraser Inc., Thorold
Ontario Paper, Thorold

Strathcona Paper, Strathcona
Great Lakes Forest Products, Dryden
E. B. Eddy, Espanola

All mills shall meet the Federal Pulp and Paper effluent regulations for suspended solids and BOD as a minimum standard and "existing" mills will be encouraged to make improvements to meet the criteria for new, altered or expanded mills.

The 1971 Federal Pulp and Paper Regulations and Guidelines set limits for suspended solids and BOD based on the production rate and the pulping and sheet formation processes used at the mill. Two limits were set for each pollutant. One limit was for existing mills; the other, for new mills. The limits were based on best practical technology prior to 1971. The Ontario Ministry of the Environment, through the Federal/Provincial Accord has agreed to enforce the Federal Regulation as a baseline limit for discharges of suspended solids and BOD.

The Ministry, with the assistance of industry, will carry out a baseline receiving water assessment for all mills, to determine the effects that mill wastewaters are having upon receiving waters. If the effluent requirement determined by the receiving water assessment is more stringent than the effluent requirement stipulated in the federal or provincial effluent regulations or guidelines, the requirement derived from the assessment will be imposed.

The assessment criteria used by the Ministry of the Environment usually involves analysis of water quality and comparisons with background water quality, investigations of biota in the water and sediments and changes from background levels and an evaluation of changes in dissolved oxygen content. In recent years, the Ministry of the Environment through the regional Technical Support Sections and through the Water Resources Branch have completed receiving water assessments in the vicinity of ten Ontario pulp or paper mills. Seven of the mill BOD limits have

been set at a more stringent level than the Federal requirement through the Control Order process. Usually, these tighter limits were set to ensure that the 47 percent dissolved oxygen content in the receiving water is maintained. The mills with more stringent receiving water requirements are:

MacMillan Bloedel Ltd., Sturgeon Falls
Great Lakes Forest Products Limited, Thunder Bay
Great Lakes Forest Products Limited, Dryden
E. B. Eddy Limited, Espanola
Spruce Falls Power and Paper, Kapuskasing
Boise Cascade Canada Ltd., Fort Frances
Domtar Packaging Ltd., Red Rock

The Ministry will establish for all mills, requirements for total suspended solids and BOD in the final effluent to be expressed in terms of

- i. an allowable number of tonnes per day, based on a 30-consecutive operating day average; and,
- ii. a "never to exceed" maximum daily loading in tonnes per day.

At the present time, only two mills, MacMillan Bloedel - Sturgeon Falls, and Spruce Falls Power and Paper - Kapuskasing, are required to meet these requirements. Several mills have daily effluent discharge limits based on a thirty-day time period. To provide adequate protection for the environment, another limit covering maximum daily loadings is necessary.

TOXICITY (Table II)

All kraft mills shall be required to meet a 96-hour fish LC_{50} of 100 percent. The Ministry should establish a standard water use figure for various process types to be used along with some variation of the toxic contribution concept.

While the toxicity testing protocol has been standardized, the interpretation and compliance requirements for the test have not been clearly developed. Any mill effluent can pass the test, if sufficient dilution water is used. At the same time, for energy conservation, mills are reducing their use of fresh water by recycling waste waters. Less effluent is discharged, with a lower contaminant load, but the concentration of pollutants has increased. These changes will increase the toxicity of the effluent and cause it to fail the toxicity test. The toxicity test protocol should recognize variations in water usage. The sampling procedure (proportional and time periods), sample conditioning and compliance (probability of being non-lethal) need to be defined. Proven technology is currently available which can be used to reduce the toxicity of kraft mill effluents to within acceptable limits. This technology is in extensive use throughout the United States and western Canada.

Present Federal legislation for toxicity is applied, in practice, only to kraft mills. Only the Domtar Packaging Limited kraft mill in Red Rock and Great Lakes Forest Products in Dryden are close to passing the test at this time. All other kraft mills in the province have or will be required to meet this Regulation.

Other types of mills, such as sulphite and TMP, are discharging toxic effluents and are not covered by this recommendation. When practical treatment technology is available at reasonable cost to reduce the toxicity of these effluents, it should be implemented.

AESTHETICS (Reference Table III)

Mills with demonstrated blowing foam or odour problems shall take steps to reduce or minimize foam and odour problems associated with wastewater effluents.

The spent cooking liquor from kraft and sulphite chemical pulping mills, when left in the effluent, is a source of odours. Condensates from the evaporator train in kraft mills contains odourous compounds which should be stripped out or treated before this effluent is discharged. Odour problems are associated with the effluents discharged from the Kimberly-Clark of Canada Limited mill in Terrace Bay, the treatment systems at Boise Cascade Canada Limited mill in Fort Frances and at the Domtar Fine Papers Limited mill in Cornwall.

Some of the organic compounds in the effluent will foam when agitated and exposed to air. These compounds should be removed at the mill through the use of spill collection and recycle systems, secondary treatment lagoons and through proper operation to prevent spills. Foam or blowing foam is currently a problem with the Boise Cascade Canada Limited lagoon in Fort Frances, the Great Lakes Forest Products Limited lagoon in Dryden, and with the effluent discharged from the James River Marathon Inc. mill in Marathon.

Mills shall install submerged diffuser outfalls where it has been established that improved dispersion will benefit the local aesthetics and minimize the area affected by the effluent.

Nineteen mills in Ontario currently discharge their wastewaters through submerged diffuser outfalls. In some other cases, the aesthetics could be improved through the use of submerged diffuser outfalls. The zone of influence of the effluent would also be reduced. These mills are:

James River Marathon Inc., Marathon
Kimberly-Clark Canada Ltd., Terrace Bay
Domtar Packaging Limited, Red Rock
Abitibi Fine Papers, Thunder Bay
Abitibi-Price Inc., Fort William Division
Abitibi-Price Inc., Thunder Bay Division
Spruce Falls Power and Paper, Kapuskasing

MIXING ZONES (Reference Table III)

The Ministry will restrict the application of mixing zones, as applied to the pulp and paper industry, to use as a planning tool, as opposed to defining regulatory boundaries.

Since the shape of the mixing zone of a plume varies continually, and the size varies with different parameters, it is difficult to set physical limitations. The mixing zones predicted from modelling studies indicate the various sizes of the dilution area. There are no mixing zones specified in current Certificates of Approvals or Control Orders.

RECEIVING WATER ASSESSMENT (Reference Table III)

Where deemed appropriate by the Ministry, mills shall conduct water quality assessment studies following the completion of major environmental projects or process changes. The terms of reference and timing for the study shall receive the prior approval of the Regional Director.

Water assessment surveys include an analysis and evaluation of sediment, aquatic flora and fauna, the water column itself, and the effluent.

The following companies have or are required to complete surveys as a result of existing Control Order requirements:

- E. B. Eddy, Espanola
- MacMillan Bloedel Ltd., Sturgeon Falls
- Abitibi-Price Incorporated, Fort William Mill
- Abitibi Fine Papers Division, Thunder Bay Mill
- Abitibi-Price Incorporated, Thunder Bay Mill
- Ontario Paper Company, Thorold
- Abitibi-Price Incorporated, Iroquois Falls
- Kimberly-Clark Canada Ltd., Terrace Bay
- Spruce Falls Power and Paper, Kapuskasing

Great Lakes Forest Products Ltd., Dryden
Boise Cascade Canada Ltd., Kenora

Without a survey following the implementation of new abatement equipment, it is difficult for the Ministry to assess the benefits to the environment and/or the need for future abatement works. It has become practice to include this type of requirement in all new Control Orders.

LAGOON GROUNDWATER MONITORING

Mills shall monitor effluent lagoons and aerated stabilization basins for groundwater contamination in a manner acceptable to the Ministry.

At the present time, primary or secondary lagoons that have been installed with monitoring wells, are operated by:

Great Lakes Forest Products Limited, Dryden
Boise Cascade Canada Limited, Fort Frances
E. B. Eddy Company Limited, Espanola

Where settling lagoons and/or aerated stabilization basins are used, the groundwater should be monitored for possible contamination.

MILL EFFLUENT MONITORING AND REPORTING

All mills shall:

- i. obtain Certificates of Approval for all new flow measurement equipment and associated recording devices;
- ii. ensure that existing flow measurement equipment is properly installed;
- iii. perform regular inspections by qualified personnel to ensure continuous normal operation of flow measurement devices and recording equipment and maintain an inspection log;

- iv. carry out an annual detailed check and calibration of the flow monitoring equipment and submit a report of this calibration to the Ministry; and
- v. in cases where the validity of reported flow data is suspect, carry out a calibration check by an independent means approved by the Ministry.

From Table IV, it is evident that the frequency of self-monitoring varies greatly. The flow measuring devices currently in use in the majority of Ontario mills, were installed in the period between 1968 and 1972. In most cases, their accuracy is not verified regularly. In two cases, at the MacMillan Bloedel Limited mill in Sturgeon Falls and Spruce Falls Power and Paper in Kapuskasing, Control Orders have been used to require annual calibration of flow monitoring equipment. In a recent court case involving Abitibi-Price Incorporated, at Iroquois Falls, the flow monitoring was proven to be in error by approximately 20 percent. Also the Spruce Falls Power and Paper mill in Kapuskasing found that the flow measuring equipment was inaccurate by approximately 35 to 40 percent when tested by fluorimetry. Other mills may have flow errors of a similar magnitude. Modern flow monitoring equipment can attain an accuracy of ± 10 percent.

All mills shall install flow proportional samplers on all final effluents.

At the present time, the only mills attempting to use flow proportional samplers are the Spruce Falls Power and Paper Company mill in Kapuskasing, and Domtar Packaging in Red Rock.

All mills shall employ analytical methods approved by the Ministry for the determination of all contaminants measured and reported to the Ministry.

The Ministry will establish a formal program of analytical quality control and quality assurance whereby, six times per year, Ministry and mill analytical data is compared, by the analysis of "split" duplicate samples of all final wastewater effluents.

The pulp and paper industry in Ontario, through the CPPA (Canadian Pulp and Paper Association) has agreed upon analytical procedures for total suspended solids and BOD to be used by their members. Mills have been using these procedures since 1976. Since that time, the test accuracy and agreement with the Ministry of the Environment sampling, has improved.

Currently, only two mills in the Province of Ontario are using methodology that has been formally approved by the Ministry of the Environment. These are: MacMillan Bloedel Limited, Sturgeon Falls and Spruce Falls Power and Paper Company Limited, Kapuskasing. This has been accomplished through requirements in recently issued Control Orders.

The following mills are participating in a program of split sample analysis:

James River Marathon Incorporated, Marathon
Kimberly-Clark Canada Limited, Terrace Bay
Domtar Packaging Limited, Red Rock
Great Lakes Forest Products Limited, Thunder Bay
Abitibi-Price Incorporated, Fort William, Thunder Bay
Abitibi-Price Incorporated, Thunder Bay Mill
Abitibi-Price Fine Papers Division, Thunder Bay
Boise Cascade Canada Ltd., Kenora
Boise Cascade Canada Ltd., Fort Frances
Great Lakes Forest Products Ltd., Dryden

Mills*** shall submit a monthly report containing daily analytical results and monthly averages as per the following table. The report shall be signed by a responsible company official.

Parameter	Units	Information Req'd	Sample Type
Flow	m ³ /day x 10 ³	daily total	continuous
Production*	tonnes/day	daily, by product	
BOD ₅	mg/l, tonnes	daily average	24 hr. comp.
COD, DOC or TOC**	mg/l, tonnes	daily average	24 hr. comp.
S.S.	mg/l, tonnes	daily average	24 hr. comp.
pH	pH units	daily max/min	continuous at kraft mills
Conductivity	µmhos	daily max/min	continuous at Kraft mills
Temperature	°C	daily maximum	(continuous in
Dissolved Oxygen	mg/l	daily minimum	receiving waters during critical periods if required)

* Proprietary.

** The Ministry will entertain requests to establish correlations between BOD and DOC or TOC analyses.

*** Non-pulping mills may request a reduced sampling frequency.

At present, three parameters, S.S., BOD and dissolved solids, are self-monitored on a routine basis. A core of common reporting requirements from all mills is desirable.

The Ministry will obtain a composite sample of all final mill effluents for an annual scan for the following parameters:

- | | |
|----------------------------|-----------------------|
| - Dissolved Organic Carbon | - Total Phenols |
| - Sulphates | - pH |
| - BOD ₅ | - Solids (Total, |
| - Conductivity | Suspended, Dissolved) |
| - Chemical Oxygen Demand | - Chlorides |
| - Speciated Phenols | - Fatty Acids |
| - Aromatic Acids | - Resin Acids |
| - Chlorophenol Scan | - Organo |
| - Phosphorus | Chlorine-Pesticide |
| | Scan |

Additional information on effluent quality is desirable in order to establish a data base which will relate effluent discharge levels to the level of contamination in receiving waters. These tests are time-consuming, expensive and, in some cases, not fully developed to be applied to pulp mill effluents. In order to develop an understanding of how these parameters affect the environment, these tests should be completed on a yearly basis by the Ministry of the Environment. Sampling and test protocols have yet to be developed for some of these parameters when applied to pulp mill effluents.

All mills shall conduct quarterly toxicity tests on all final effluents. The acceptable method is the 96-hour/LC₅₀/100 percent toxicity test as described in the M.O.E. test protocol, using a minimum four-hour composite sample. Mills which demonstrate a consistent, non-toxic effluent for a period of two years may conduct toxicity testing on an annual basis.

Toxicity in the past has been predominantly done by the regulatory agencies on a four-year rotation program. The acceptable toxicity tests should be done quarterly by the industry. After passing the 96-hour test on a quarterly basis for two years, the frequency could be reduced.

Only one mill, Domtar Packaging Limited in Red Rock, is performing toxicity tests on the final effluent on a quarterly basis as of January, 1983 and MacMillan Bloedel in Sturgeon Falls are conducting yearly testing. Domtar Fine Papers Limited in Cornwall has been doing some toxicity testing on a regular basis and the E. B. Eddy Mill in Espanola is currently setting up a toxicity lab.

STATUS SOLID WASTE DISPOSAL

PROBLEM IDENTIFICATION (Reference Mill Sheets)

Mills with waste disposal sites identified as having off-property flowing leachate discharges shall make provisions for leachate collection at a common point. At sites where leachate demonstrates an environmental impact, mills shall install treatment works or make suitable arrangements for control.

For some site-specific locations, mills have been directed to do groundwater monitoring for potential leachate problems. Only one mill, operated by Great Lakes Forest Products Limited in Thunder Bay is collecting and treating leachate from a waste disposal site. The collected leachate is sprayed back over the disposal site in order to breakdown the BOD. The leachate at the end of the season (fall), is then hauled to the municipal sewer system for disposal. Spruce Falls Power and Paper mill in Kapuskasing is collecting the leachate and are treating it with lime for pH control prior to discharge to the Kapuskasing River.

The Domtar Fine Papers mill in Cornwall and Boise Cascade Canada Ltd., Kenora are collecting leachate from the waste disposal site and are pumping the leachate to a municipal sewer system.

SITE MANAGEMENT

All mills operating active disposal sites shall be required to submit a Site Management Plan acceptable to the Regional Director to include but not necessarily limited to:

- i. location and planning concerns;
- ii. types of waste certified for deposit;
- iii. detailed description of the operation;
and
- iv. closure procedures.

Currently, twelve of the pulp and paper mills in the province have submitted operating plans for their waste sites. Eight mills are disposing of their wastes through private contractors. The other mills will be required to submit these plans.

All operating sites not presently certified under Part V of the Environmental Protection Act, shall be upgraded, allowing the Ministry to issue Provisional Certificates of Approval.

There are only two uncertified sites in Ontario which are located on company property at the E. B. Eddy mill in Espanola:

The Ministry will undertake a survey of all active and abandoned solid waste disposal sites serving the pulp and paper industry to include:

- i. actual and potential concerns relating to nuisance fires and complications with respect to methane generation;
- ii. the deposit of unlicensed waste;
- iii. the existence, course of travel and environmental impact of any identifiable surface flowing leachates; and
- iv. the probable consequences of groundwater contamination.

Most of the existing landfill sites have been evaluated by Ministry staff. A review of all operating landfill sites in the province was completed in 1983 and has addressed the above concerns.

LEACHATE CONTROL

Mills with active or abandoned solid waste disposal sites, having off-property leachate discharges or the potential for consequential groundwater contamination, shall be required to institute a monitoring program to the satisfaction of the Ministry.

At the present time, there are no known problems with off-property flowing leachate from active or abandoned solid waste disposal sites operated by pulp and paper companies. This recommendation has been included for future reference should problems be identified.

MONITORING AND REPORTING

For each active disposal site, all mills shall provide a monthly report stating the types and volumes of waste deposited in the site over the previous reporting period.

Presently, the Boise Cascade Canada Limited mill in Kenora is submitting this information with their monthly effluent report. The Domtar Fine Paper mill in Cornwall is occasionally submitting data on the volumes and type of waste sent to disposal sites. The Industrial Monitoring Information System (IMIS) has been developed so that it can be expanded to include this type of information.

TABLE 1

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product Type	Megagrams/day		Process	Typical Problem Areas Comments
		1970	1982		
Abitibi-Price, Inc. at Iroquois Falls (A-P @ Iroquois Falls) Sole major employer.	Newsprint/ boxboard	891	907	Sulfite	Sulphur dioxide and odours are emitted from sulfite digesters but there have been no SO ₂ property damage and no odour complaints. Spent liquor contains organics that are toxic to fish and may have human health implications.
				Stone groundwood (mechanical)	Groundwood effluent contains organics that are toxic to fish. Total Suspended Solids are under control.
Abitibi-Price, Inc. at Smooth Rock Falls (A-P @ Smooth Rock Falls) Sole major employer.	Kraft Pulp	297	299	Kraft	Some odorous compounds and particulate from the recovery furnace and the lime kiln are under control because scrubbers were installed. An extra scrubbing stage can be made operational to remove additional odours from the recovery furnace. Effluent contains organics that are toxic to fish and may have human health implications. Total Suspended Solids are under control.
Abitibi-Price, Inc. at Thunder Bay (A-P @ T. Bay) Significant employer.	Newsprint	421	414	Sulfite	Sulphur dioxide and odours are emitted by digesters but there has been no property damage from SO ₂ and no odour complaints. Effluent is toxic to fish and contains organics that may have human health implications.
				Stone groundwood (mechanical)	Effluent is toxic to fish. Total Suspended Solids are under control. Note high bacteria count.

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Process	Typical Problem Areas	
	Type	Megaograms/day 1970 1982		Comments	
Abitibi-Price, Inc. at Fort William, Thunder Bay (A-P @ Ft. Wm., T. Bay) - Significant employer.	Newsprint	336 320	Sulphonated- Chemical- Mechanical (SCM/mechanical) Stone groundwood	New process (SCM) replaced old sulfite mill and the BOD load was reduced. Effluent contains organics that are toxic to fish. Total Suspended Solids are under control. Note bacteria count.	
Abitibi-Price, Inc. at Provincial, Thunder Bay (A-P @ Prov. T. Bay) Significant employer.	Fine Papers	231 275	Stone groundwood (mechanical) and the use of purchased pulp	Old sulphite process was shutdown and pulp is purchased; effluent showed BOD level reduction with shutdown. Although effluent contains organics that are toxic to fish, concentration has been diluted due to water usage at paper machine and fish toxicity test is passed. CONTINUED GOOD CONTROL IS ONLY REQUIREMENT. Total Suspended Solids are under control. Note bacteria count.	
The Beaver Wood Fibre Co. Ltd. at Thorold (Beaver @ Thorold) Small employer.	Boxboard	275 250	Clean waste paper is pulped	Air emissions and effluent are under control. Note high bacteria in 12 Mile Creek. Discharge is visible in Beaverdams Creek. CONTINUED GOOD CONTROL IS THE ONLY REQUIREMENT.	

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Process	Typical Problem Areas	
	Type	Megagrams/day 1970 1982		Comments	
Boise Cascade Canada Ltd. at Fort Frances (Boise @ Fort Frances) Sole major employer.	Groundwood Kraft pulp	419 1,049	Kraft Stone groundwood (mechanical)	Odours and particulate from the kraft recovery furnace and the lime kiln are under control. Lesser sources are being brought under control finally. Secondary treatment reduces organics from kraft mill to acceptable level. Total Suspended Solids are under control. Note high bacteria in River. Effluent fish lethality varies from pass to fail.	
Boise Cascade Canada Ltd. at Kenora (Boise @ Kenora) Sole major employer.	Newsprint	658 668	Sulfite Stone groundwood (mechanical)	Sulphur dioxide and odours are emitted from digesters; abatement equipment is in place to control them. Effluent contains organics that are toxic to fish and may have human health implications. Note bacteria in river. Woodyard and chipping operations are being modernized.	
Domtar Fine Papers Ltd. at Cornwall (Domtar @ Cornwall) Significant employer.	Fine Papers	600 741	Kraft and purchased pulp	Odorous compounds and particulate from kraft recovery furnace, the lime kiln and condensates are under control. Lesser odour sources need to be brought under control. Chlorinated organics in effluent require removal and may have human health implications. Total Suspended Solids are under control. Coloured plume is observed for 18 kilometers. Effluent bacteria counts are high.	

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Typical Problem Areas	
	Type	Megagrams/day 1970 1982	Process	Comments
Domtar at Red Rock (Domtar @ Red Rock) Sole major employer.	Corrugating Medium and Newsprint	638 593	Kraft Stone groundwood (mechanical)	Odorous compounds and particulate from kraft recovery furnace, lime kiln and condensates are under control. Lesser odour sources need to be controlled. Chlorinated organics in effluent require removal and may have human health implications. Total Suspended Solids are under control.
Domtar Fine Papers Ltd. at St. Catharines (Domtar @ St. Catharines) Small employer.	Fine papers	78.9 144	Clean waste paper and purchased pulp are used.	Air emissions and effluent are under control. High bacteria count in 12 Mile Creek. CONTINUED GOOD CONTROL IS THE ONLY REQUIREMENT.
Domtar at Thorold (Domtar @ Thorold) Very small employer.	Building paper (asphalt coated)	47 63	Purchased pulp and wood flour are used	Hydrocarbons from new asphalt coat paper dryer require control. Effluent volume was reduced by 80%. Effluent fails fish toxicity test. Total Suspended Solids are under control. High bacteria count in 12 Mile Creek.
Domtar at Trenton (Domtar @ Trenton) Significant employer.	Corrugating Medium	136 157	Sodium carbonate pulping	No odours or particulate are emitted from pulping. Spent liquor is used as a road dust suppressant. Effluent volume was reduced 89%. Effluent still contains organics toxic to fish. Total Suspended Solids are under control.

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Typical Problem Areas		
	Type	Megagrams/day		Process	Comments
		1970	1982		
E. B. Eddy at Espanola (Eddy @ Espanola) Sole major employer.	Bleached and unbleached kraft paper Parchment	523	620	Kraft	Odorous compounds and particulate from the recovery furnace, the lime kiln and condensates are under control. Secondary effluent treatment was put on stream, fall of 1983. Major improvements require evaluation. Total Suspended Solids are under control.
E. B. Eddy at Ottawa (Eddy @ Ottawa) Very small employer.	Fine papers	195	158	Purchased pulp is used.	Air emissions, effluent loadings and solids wastes are under control. Some fine effluent improvements may be needed. Total Suspended Solids are under control.
Fraser Inc. at Thorold (Fraser @ Thorold) Significant employer.	Fine papers	216	218	Used waste paper (ledger grade) is deinked. Purchased clean waste paper and pulp are used.	Air emissions, effluent quality and solid wastes are under control. CONTINUED GOOD CONTROL IS THE ONLY REQUIREMENT IN PARTICULAR FOAM FROM EFFLUENT TREATMENT PROCESS. Bacteria count is high in 12 Mile Creek.
Great Lakes Forest Products at Dryden (Gr. Lakes @ Dryden) Sole major employer.	Kraft pulp and paper	523	573	Kraft	Odorous compounds and particulate from the recovery furnace, the lime kiln, the smelt tank and condensates are under Control. Secondary effluent treatment was put on stream late summer 1983. Major improvements require evaluation. Total Suspended Solids are under control. High bacteria count at water quality station.

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Typical Problem Areas	
	Type	Megagrams/day 1970 1982	Process	Comments
Great Lakes Forest Products at Thunder Bay (Gr. Lakes @ T. Bay) Very significant employer.	Kraft pulp and newsprint	1,585 1,964	Two kraft mills Sulfite Stone groundwood (mechanical)	Process effluent from kraft mills is closed or recycled about 95% of the time. Spent sulfite liquor is recovered in kraft recovery furnaces. Effluent from stone groundwood mill is toxic to fish. Condensates from sulfite mill require treatment. Secondary odour sources may require control. Total Suspended Solids are under control. All particulate point sources are under control. High bacteria count at water quality station. Dissolved oxygen problem in river.
James River at Marathon (James @ Marathon) Sole major employer.	Kraft Pulp	443 393	Kraft	Odours and particulate from the recovery furnace, the smelt tank and the lime kiln are under control. Effluent contains organics that are toxic to fish and may have human health implications. Condensates require stripping. Total Suspended Solids are under control. PCB's in lake sediment.
Kimberly-Clark of Canada Ltd. at Huntsville (K.C. @ Huntsville) Small significant employer.	Tissue	85 104.3	Purchased pulp is used.	Air emissions, effluent quality and solid wastes are under control. CONTINUED GOOD CONTROL IS THE ONLY REQUIREMENT. Proposed expansion may require changes in effluent treatment system.

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Product		Typical Problem Areas	
	Type	Megagrams/day		Comments
		1970	1982	
Kimberly-Clark of Canada Ltd. at St. Catharines (K.C. @ St. Catharines) Small employer.	Tissue and crepe wadding	96	84.7	Purchased pulp and clean waste paper is used. Air emissions, effluent quality and solid wastes are under control. CONTINUED GOOD CONTROL IS THE ONLY REQUIREMENT.
Kimberly-Clark of Canada Ltd. at Terrace Bay (K.C. @ Terrace Bay) Sole major employer.	Kraft Pulp	381	785	Kraft Odours and particulate from the recovery furnace, the lime kiln and condensates are under control. Effluent contains organics that are toxic to fish and have human health implications. Mill still has problems with pollution control systems. Total Suspended Solids are under control. Bacteria counts are high at water quality station. Creek used to carry effluent to Lake Superior is grossly polluted.
MacMillan Bloedel Ltd. at Sturgeon Falls (Mac @ Sturgeon Falls) Sole major employer.	Corrugating medium/hardboard siding	350	278	Neutral sulfite semi-chemical/thermomechanical Odours and sulphur dioxide are emitted from digesters. Effluent is high in organics that are toxic to fish and may have human health implications. Total Suspended Solids are under control. Effluent bacteria counts are high.

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

Company and Location (Abbreviation)	Type	Product		Process	Typical Problem Areas	
		Megagrams/day 1970	1982		Comments	
Ontario Paper Company Ltd. at Thorold (Ontario @ Thorold) Very significant employer.	- Newsprint - Industrial alcohol - Vanillin products - salt cake - groundwood specialty	724 (6.5) - -	408 (6.5) (144) 63	Thermal mechanical Sulfite Chemical-mechanical Newspapers are deinked By-product chemicals	Odours and sulphur dioxide from the sulfite digesters are under control. Deink plant effluent and sulphite condensates receive secondary treatment. Spent sulfite liquor is recovered. Fish toxicity test has been passed consistently prior to modernization. A few effluent refinements are needed for stable control. Total Suspended Solids are under control. Bacteria content is high in 12 Mile Creek.	
Spruce Falls Power and Paper Co. at Kapuskasing (Spruce @ Kapuskasing) Sole major employer.	Newsprint	1,046	942	Stone groundwood Thermal mechanical sulfite (Magnefite)	Organics in the effluent are being reduced in a phased program to meet Control Order. Odours from the magnefite mill should be reduced. Total Suspended Solids are under control.	
St. Mary's Paper at Sault Ste Marie (SMP @ Slt Ste Marie) Significant employer.	Groundwood Specialties	314	327	Stone groundwood (mechanical)	Effluent contains organics that are toxic to fish. Combustion of wood residues occasionally violates opacity. Total Suspended Solids are under control.	
Strathcona Paper at Strathcona (Strathcona @ Strhon) Sole major employer.	Boxboard	82.5	121.6	Purchased wastepaper and pulp is used.	Temporary odour problem due to anaerobic condition in one lagoon.	

TABLE 1 continued

MILL/LOCATION/PRODUCTS/PROCESSES/PROBLEMS - ONTARIO'S PULP AND PAPER INDUSTRY

<u>Company and Location</u> <u>(Abbreviation)</u>	<u>Product</u>		<u>Typical Problem Areas</u>	
	<u>Type</u>	<u>Megagrams/day</u>	<u>Process</u>	<u>Comments</u>
		<u>1970</u> <u>1982</u>		
Trent Valley Paperboard at Glen Miller (Trent @ Glen Miller) Sole major employer.	Boxboard	70.7 253	Purchased wastepaper and pulp	
		=====		
	TOTALS	11,662.1 12,839.6		
		=====		

NOTE: most Ontario mills were not producing at capacity in 1982 due to poor market demand.

TABLE 2

SELF-MONITORING AND REPORTING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	EFFLUENT							AIR EMISSIONS				
	Monthly Report	Flow	Composite	Frequency		Toxicity Done by	MOE Audit	Monthly Report	Monitored			Stack Surveys
				TSS	BOD				Particulate	Odours	Sulphur Dioxide	
A-P @ Iroquois Falls	yes	daily	yes	daily	daily	MOE	6/year	no	no	no	NOT NEEDED	Never
A-P @ Smth Rock Falls	yes	daily*	yes	daily	2/week	MOE	6/year	no	no	yes	no	Partly
A-P @ T. Bay	yes	daily*	yes	daily	1/week	MOE	6/year	no	no	no	NOT NEEDED	Never
A-P @ Ft. Wm., T. Bay	yes	daily*	yes	daily	1/week	MOE	1/month	no	no	no	NOT NEEDED	Never
A-P @ Prov., T. Bay	yes	daily	yes	daily	1/week	MOE	1/month	no	no	NOT	NEEDED	Never
Beaver @ Thorold	yes	daily*	yes	daily	3/week	MOE	1/month	no	N O T N E E D E D			Never
Boise @ Fort Frances	yes	daily	yes	daily	3/week	MOE	1/month	no	no	no	no	Monthly
Boise @ Kenora	yes	daily*	yes	daily	2/week	MOE	1/month	no	no	no	every 8 hours	Partly
Domtar @ Cornwall	yes	daily*	yes	daily	daily	Co./MOE	1/month	yes	no	yes	NOT NEEDED	Once
Domtar @ Red Rock	yes	daily	yes	daily	daily	Co./MOE	6/year	no	no	yes	NOT NEEDED	Partly
Domtar @ St. Catharines	yes	daily*	yes	daily	daily	MOE	1/month	no	N O T N E E D E D			Never

* Accuracy is not well established; has not been calibrated during past five years.

TABLE 2 continued

SELF-MONITORING AND REPORTING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	EFFLUENT							AIR EMISSIONS				
	Monthly Report	Flow	Composite	Frequency		Toxicity Done by	MOE Audit	Monthly Report	Monitored			Stack Surveys
				TSS	BOD				Particulate	Odours	Sulphur Dioxide	
Domtar @ Trenton	yes	daily	yes	daily	1/week	Co./MOE	4/year	no		no	NOT NEEDED	Never
Domtar @ Thorold	yes	daily*	yes	weekly	monthly	MOE	1/month	no	no	hydro-carbons	NOT NEEDED	
Eddy @ Espanola	yes	daily	yes	daily	1/week TOC	MOE	6/year	no	yes			Every 2 years
Eddy @ Ottawa	yes	continuously*	yes	daily	daily	MOE	4/year	no	N O T	N E E D E D		Never
Fraser @ Thorold	yes	continuously	yes	daily	4-5/week	MOE	1/month	no	N O T	N E E D E D		Never
Gr. Lakes @ Dryden	yes	daily	yes	daily	daily	MOE 2/year	6/year	no	yes	yes		Once
Gr. Lakes @ T. Bay	yes	daily	yes	daily	daily	MOE	2/month	no	yes	yes	yes	Frequently
James @ Marathon	yes	daily*		daily	3/week	MOE	2/month	no	yes	yes		Partly
K.C. @ Huntsville	yes							no	N O T	N E E D E D		Never

* Accuracy is not well established; has not been calibrated during past five years.

TABLE 2 continued

SELF-MONITORING AND REPORTING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	EFFLUENT							AIR EMISSIONS				
	Monthly Report	Flow	Composite	Frequency		Toxicity Done by	MOE Audit	Monthly Report	Monitored			Stack Surveys
				TSS	BOD				Particulate	Odours	Sulphur Dioxide	
K.C. @ St. Catharines	yes	continuously	yes	daily	1/week	MOE	1/month	no	N O T	N E E D E D		Never
K.C. @ Terrace Bay	yes	daily	yes	daily	TDS	MOE	2/month	no		yes		Once
Mac @ Sturgeon Falls	yes	continuously	yes	daily	daily	Co./MOE	2/year	no	no	no	NOT NEEDED	Never
Ontario @ Thorold	yes	continuously	yes	daily	1/week	MOE	1/month	no			yes	Partly
SMP @ St. Marie	yes	daily*	yes	daily	1/week	MOE	1/month	no	no		NOT NEEDED	Never
Spruce @ Kapuskasing	yes	daily	yes	daily	daily	MOE	1/month	no			NOT NEEDED	Never
Strathcona @ Stronach	no	weekly*	yes	1/week	1/week	MOE	12/year	no	N O T	N E E D E D		Never
Trent @ Glen Miller	no	daily*	yes	daily	TDS	MOE	12/year	no	N O T	N E E D E D		Never

* Accuracy is not well established; has not been calibrated during past five years.
TDS - Total Dissolved Solids instead of BOD is determined.

TABLE 3

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
A-P @ Iroquois Falls (19-0064-031-042) Abitibi River	Land downstream of mill is sparsely settled. River is a popular canoe route with a few tourist camps. Gravel bottom results in little sedimental oxygen demand. Company operates a continuous dissolved oxygen monitor $\frac{1}{4}$ mile from mill at bridge. Sampled at tailrace below dam - good mixing. Annual arithmetic mean - D.O. - 0.31. Annual geometric mean, BOD 0.55 mg/l.	Town surrounds only major industry on three sides. One dustfall jar monitors air quality.
A-P @ Smth Rock Falls (19-0064-033-02) Mattagami River	Water quality station is approximately 12 miles downstream. Annual arithmetic mean - D.O., 7.44; BOD, 0.79.	Mill is located north of the town but close to it. Recovery furnace odours are monitored continuously at stack. One continuous reduced sulphur compounds ambient air monitor is to be installed in 1984 by MOE.
A-P @ T. Bay Lake Superior	Plume is highly visible. Annual arithmetic mean - TSS, 120.; D.O., 8.1; BOD, 3.9. Annual geometric mean - total coliform, 8,265; fecal coliform, 97. Mill is approximately half a mile from fresh water intake for city of Thunder Bay.	Mill is located on the shore of Lake Superior within the City limits of Thunder Bay. Hi-volume sampler, five continuous sulphur dioxide monitors, three dustfall stations and one continuous meteorological station, monitor air quality within the city.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
A-P @ Ft. Wm., T. Bay (01-0000-001-01) Thunder Bay Harbour Lake Superior	Plume is visible. Water station is inside the harbour. Annual arithmetic mean - TSS, 79.0; D.O., 10.5; BOD, 0.8. Annual geometric mean - total coliform, 366; fecal coliform, 34.	Mill is located south of the City of Thunder Bay, but close to the city limits. Mill is adjacent to Indian Reservation.
A-P @ Prov., T. Bay (01-0000-004-01) Eastern gap of Thunder Bay Harbour, Lake Superior.	Water quality station is near Provincial Mill. Annual arithmetic mean - D.O., 10.0; BOD, 5.0. Annual geometric mean - total coliform, 162; fecal coliform, 17. Chalky coloured plume is highly visible due to clays in effluent.	Mission mill is located on the shore of Lake Superior within the City limits of Thunder Bay adjacent to the Abitibi-Price Thunder Bay mill. No homes are nearby.
Beaver @ Thorold Beaverdams Creek, Lake Gibson	Effluent is discharged into Beaverdams Creek which enters Gibson Lake via a syphon under the Welland Ship Canal. Several homes are near Lake Gibson. Station is at Wellandvale Bridge, St. Catharines - 12 miles away from mill. Annual arithmetic mean - TSS, 207; D.O., 11.8. Annual geometric mean - total coliform, 8,045; fecal coliform, 901. City of St. Catharines is considering using Lake Gibson as a drinking water reservoir.	Mill is located in the Town of Thorold. No air emission monitoring is required.

TABLE 3 continued

MDE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
Boise @ Fort Frances (19-0001-012-02) Rainy River	Several homes and tourist camps are downstream of mill. Plume is visible in river. Water quality station is four miles downstream of mill. Annual arithmetic mean - TSS, 9.8; D.O., 1.0, Annual geometric mean - total coliform, 1,913. fecal coliform, 775. Boise Cascade mill in U.S.A. opposite Fort Frances also discharges into Rainy River.	Mill is located in the City of Fort Frances close to the Rainy River. Homes surround the mill. Nine dustfall jars, one reduced sulphur compounds monitor and a continuous meteorological station monitor air quality.
Boise @ Kenora (19-0001-001-02) Winnipeg River	Downstream there are several fishing camps and homes. Water quality station is $\frac{1}{2}$ mile west of Main St. Annual arithmetic mean - TSS 4.1; D.O., 9.9, 10.7; BOD, 2.7, 0.6. Annual geometric mean - total coliform, 186; fecal coliform, 19.	Mill is located in the north part of Kenora. Three dustfall jars and four sulphation candles (SO ₂) monitor air quality. Vegetation had been damaged by SO ₂ bursts from sulphite digesters.
Domtar @ Cornwall St. Lawrence	Plume is very noticeable from bridge for 18 kilometers. Downstream bathing beaches are affected by bacteria in plume. Water is used for drinking by several downstream homes, towns.	Mill is in the south part of Cornwall and next to the St. Lawrence River. Continuous meteorological station, one hi-volume sampler, one dustfall jar and 2 stations for H ₂ S monitor air quality.
Domtar @ Red Rock Lake Superior	Commercial fishery existed in Bay once. Since there is no water quality monitoring station, a lake survey must be made. Plume is highly visible in the lake.	Mill is located on the north shore of Lake Superior in the improvement district of Red Rock, approximately 115 kilometres northeast of Thunder Bay. Homes are west of the mill. Odours are noticed on Highway 17. Four dustfall jars and one sulphation candle (SO ₂) monitor air quality.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
Domtar @ St. Catharines (06-0017-002-02) (Old Welland Canal)	Effluent is discharged into an open section of the Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development. Station is at Wellandvale Ave., St. Catharines, 6 miles from mill. Annual arithmetic mean - TSS 207, D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; fecal coliform, 226. A very small volume of a milky effluent is discharged.	Mill is located at 343 Glendale Avenue in the City of St. Catharines in the Regional Municipality of Niagara and is surrounded by factories and homes. No air emission monitoring is required.
Domtar @ Thorold (06-0017-002-02) Canal	Effluent is discharged into a submerged section of the Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development. MOE Water Quality station is at Wellandvale Ave., St. Catharines, 8 miles from mill. Annual arithmetic mean - TSS, 207; D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; fecal coliform 226.	Homes are on the other side of the Welland Canal across from the mill. No air emission monitoring is required.
Domtar @ Trenton (#95) Trent River	River and effluent passes through the city of Trenton. MOE Water Quality sampling station is upstream of mill.	Factories, commercial area and homes are near mill. No air emission monitoring is required.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
Eddy @ Espanola (14-0028-057-02) Spanish River	Recreational and tourist use is made of the river downstream of the mill. Many cottages are downstream of mill. Water quality station is 3 miles downstream of mill. Annual arithmetic mean - D.O., 7.91; BOD, 2.36.	Recreational and tourist use is made of the surrounding area around the mill. Mill is located in the northeast part of the town on the southern shore of the Spanish River. Mill can be seen from highway. Two hi-volume samplers (MOE/E.B. Eddy) monitor air quality. Eddy maintains a dustfall jar.
Eddy @ Ottawa (#129) Ottawa River	On occasion the Plume is visible from several locations in Ottawa. There is no water quality station.	Mill is located on Chaudiere Island in the Ottawa River at the foot of Booth Street in the City of Ottawa. Air emission monitoring - none is required.
Fraser @ Thorold (06-0017-002-02) Old Welland Canal	Effluent is discharged into an open section of the Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development. MOE Water quality station is at Wellandvale Ave., St. Catharines, 7 miles from mill. Annual arithmetic mean - TSS, 207; D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; fecal coliform, 226.	Mill is located in downtown Thorold. It is bordered by John St. to the east, Pine St. to the west and is just south of St. Davies Road. Mixed land use - homes are nearby. No air emission monitoring is required.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
Gr. Lakes @ Dryden (19-0001-006-02) Wabigoon River	Water quality station is 500 feet downstream of diffuser at bridge to golf course. Annual arithmetic mean - TSS, 12.4, D.O., 8.0; BOD, 6.8. Annual geometric mean - total coliform, 38,978; fecal coliform 226.	Mill is located within Town of Dryden. One continuous reduced sulphur compounds analyzer and six dustfall jars monitor air quality.
Gr. Lakes @ T. Bay (01-0000-002-01) Kaministiquia River	River is navigable below the outfalls of the mill and the mouth of the Kaministiquia River is a popular boating area. Annual arithmetic mean - TSS, 134.2; D.O., 9.5; BOD, 1.1. Annual geometric mean - total coliform, 3,699; fecal coliform, 124.	Separation distance from homes is about 1 mile. Mill is near airport and odours have been noticed by travellers.
James @ Marathon Lake Superior	Lake survey must be made to establish water quality effects. Tourists visiting Pebble Beach complaint about highly visible plume (colour, foam, odour).	Mill is located in the Township of Marathon in the district of Thunder Bay on the shore of Lake Superior. Four dustfall jars and one continuous reduced sulphur compounds analyzer monitor air quality.

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
Gr. Lakes @ T. Bay (01-0000-002-01) Kaministiquia River	River is navigable below the outfalls of the mill and the mouth of the Kaministiquia River is a popular boating area. Annual arithmetic mean - TSS, 134.2; D.O., 9.5; BOD, 1.1. Annual geometric mean - total coliform, 3,699; fecal coliform, 124.	Separation distance from homes is about $\frac{1}{2}$ mile. Mill is near airport and odours have been noticed by travellers.
James @ Marathon Lake Superior	Lake survey must be made to establish water quality effects. Tourists visiting Pebble Beach complaint about highly visible plume (colour, foam, odour).	Mill is located in the Township of Marathon in the district of Thunder Bay on the shore of Lake Superior. Four dustfall jars and one continuous reduced sulphur compounds analyzer monitor air quality.
K.C. @ Huntsville East River	Downstream river passes through a prime tourist and recreational area. Annual arithmetic mean - TSS, 81; D.O., 10.3. There is no direct discharge of effluent into the river.	Mill is remote from residences but in a popular tourist area. No air monitoring is required.

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
K.C. @ St. Catharines (06-0017-002-02) Old Welland Canal	Effluent is discharged into open section of Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development along the Old Welland Canal route. Water quality station is at Wellandvale in St. Catharines, 4 miles away from mill. Annual arithmetic mean - TSS, 207; D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; fecal coliform, 901.	Mill is located in the City of St. Catharines on the west side of Merritt Street adjacent to the boundary of the City of St. Catharines and the City of Thorold. Land use is mixed. No air emission monitoring is needed.
K.C. @ Terrace Bay (01-0074-001-02) effluent canal at Lake Superior	Mill effluent is discharged into Blackbird Creek. Although sections of the Creek at the highway have been covered, the uncovered sections are odour sources. Plume is highly visible. Station is at Highway 17. Annual arithmetic mean - TSS, 1,369.6; D.O., 5.0; BOD, 170.0. Annual geometric mean - total coliform, 22,462; fecal coliform, 17,153.	Mill is located in the Township of Terrace Bay in the District of Thunder Bay above the town. Six dustfall jars and one continuous reduced sulphur compounds analyzer monitor air quality.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location (Water quality station No.) Receiving Water	Water - Downstream Use Nearest Monitoring Station Location - Parameters in milligram/litre	Air Emissions and Land Use
K.C. @ Huntsville East River	Downstream river passes through a prime tourist and recreational area. Annual arithmetic mean - TSS, 81; D.O., 10.3. There is no direct discharge of effluent into the river.	Mill is remote from residences but in a popular tourist area. No air monitoring is required.
K.C. @ St. Catharines (06-0017-002-02) Old Welland Canal	Effluent is discharged into open section of Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development along the Old Welland Canal route. Water quality station is at Wellandvale in St. Catharines, 4 miles away from mill. Annual arithmetic mean - TSS, 207; D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; fecal coliform, 901.	Mill is located in the City of St. Catharines on the west side of Merritt Street adjacent to the boundary of the City of St. Catharines and the City of Thorold. Land use is mixed. No air emission monitoring is needed.
K.C. @ Terrace Bay (01-0074-001-02) effluent canal at Lake Superior	Mill effluent is discharged into Blackbird Creek. Although sections of the Creek at the highway have been covered, the uncovered sections are odour sources. Plume is highly visible. Station is at Highway 17. Annual arithmetic mean - TSS, 1,369.6; D.O., 5.0; BOD, 170.0. Annual geometric mean - total coliform, 22,462; fecal coliform, 17,153.	Mill is located in the Township of Terrace Bay in the District of Thunder Bay above the town. Six dustfall jars and one continuous reduced sulphur compounds analyzer monitor air quality.

TABLE 3 continued

MDE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

<u>Mill and Location</u> <u>(Water quality station No.)</u> <u>Receiving Water</u>	<u>Water - Downstream Use</u> <u>Nearest Monitoring Station</u> <u>Location - Parameters in milligram/litre</u>	<u>Air Emissions and Land Use</u>
Mac @ Sturgeon Falls (03-0133-018-02) Sturgeon River	A fishery and several tourist camps are downstream of the mill. Water quality station is no longer sampled. At least one camp uses the river as water supply. There are not public beaches but casual swimming does occur. High levels of Klebsiella and Pseudomonas - have been measured. Severe dissolved oxygen depletion has been experienced downstream of mill during low flow and high temperature summer periods.	Mill is located immediately north of Highway 17 on the west side of the Sturgeon River. No air pollution complaints although the mill is located immediately adjacent to residences.
Ontario @ Thorold (06-0017-002-02) Old Welland Canal	Effluent discharged into a submerged section of the Old Welland Canal. Prime residential areas overlook the canal and there are plans for park and recreation development. Water quality station is at Wellandvale Ave., in St. Catharines and monitors all pulp/paper mills in Niagara. Annual arithmetic mean - TSS, 207; D.O., 11.8; BOD, 1.5. Annual geometric mean - total coliform, 8,045; Fecal coliform, 6.	Prime residential areas overlook the canal. Ministry's SO ₂ monitor is at gate to mill. Mill is surrounded by farmland, highways and Welland Ship canal on three sides. Homes are located on fourth side.
Spruce @ Kapuskasing (19-0064-010-02) Kapuskasing River	Plume is noticeable in river through town. No downstream residents once the river leaves the town of Kapuskasing. Water Quality station is not sampled anymore.	Mill is across from the town - separated by the highway, river and bridge. Ten dustfall jars monitor air quality.

TABLE 3 continued

MOE'S AIR AND WATER QUALITY MONITORING - ONTARIO'S PULP AND PAPER INDUSTRY

<u>Mill and Location</u> <u>(Water quality station No.)</u> <u>Receiving Water</u>	<u>Water - Downstream Use</u> <u>Nearest Monitoring Station</u> <u>Location - Parameters in milligram/litre</u>	<u>Air Emissions and Land Use</u>
SMP @ St Ste Marie (13-000-007-02) St. Mary's River, International Watercourse	St. Joseph's Island residents downstream of mill use the St. Mary's River as a source of drinking water. Effluent from steel-making complex discharges into St. Mary's River also. Sampled at civic centre of Sault Ste. Marie. Annual arithmetic mean - TSS, 68; BOD, 11.3.	Mill is sited in the industrial area of the city. MOE has a continuous hourly meteorological station as well as 5 dustfall jars and hi-volume samplers monitor air. System was set-up to monitor emissions from large steel-making complex.
Strathcona @ Strhen (17-0035-001-02) Napanee River	Water quality Station is at the river flow gauge - a Federal measurement. Annual arithmetic mean - D.O., 10.3; BOD, 1.0.	No air emissions monitoring is required.
Glen Miller (17-0021-045-02) Trent River	Effluent is sporadically discharged into River. Fishing is popular downstream of the mill and the river is part of the popular in-land waterway - Trent/Severn systems. Water quality Station is at the highway bridge near Trenton, one mile from the mill; the Annual arithmetic mean - D.O. 9.3.	No air emission monitoring is required.

TABLE 4

EFFLUENT QUALITY 1970/1982/1984 - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	TOTAL SUSPENDED SOLIDS Megagrams per day				BIOCHEMICAL OXYGEN DEMAND Megagrams per day				FISH TOXICITY TEST			FLOW - thousand cubic metres/day	
	1970	1982	% re- duction	1984 * **	1970	1982	% re- duction	1984 * **	1970	1982	1984 **	1970	1982
A-P @ Irqs Fls	29.8	4.5	84.9	4.9	56.3	53.6	9.4	13.0		lethal		98.3	60.0
A-P @ Smth R. Fls	11.6	3.0	74.2	3.0	16.7	7.8	53.3	7.0		lethal		59.2	47.7
A-P @ T. Bay	1.9	1.0	37.5	1.5	24.2	19.8	10	20.0		lethal		44.5	29.9
A-P @ Ft. Wm., T. Bay	1.0	1.2	(+20)	1.2	23.0	10.2	55.6	10.2		lethal		25.1	22.6
A-P @ Prov., T. Bay	5.0	1.5	70	2.0	48.5	3.2	93.8	4.0	lethal	non-lethal		93.3	47.9
Beaver @ Thrld	9.3	.78	92.1	.8	4.9	2.0	59.2	1.9	lethal	non-lethal		23.0	13.3
Boise @ Ft. Fr.	4.9	7.8	(+59.0)	7.5	8.2	12.2	(+49.0)	10.0	lethal	pass	non-lethal	32.0	72.2
Boise @ Kenora	8.5	6.8	20.0	6.5	33.4	33.0	1.0	30.0		lethal		53.8	63.8
Domtar @ Crnwll	63.0	10.5	83.4	7.6	53.2	13.3	75.0	20.2		lethal		223.0	114.0

* Limit set by MOE.

** projected

TABLE 4 continued

EFFLUENT QUALITY 1970/1982/1984 - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	TOTAL SUSPENDED SOLIDS Megagrams per day				BIOCHEMICAL OXYGEN DEMAND Megagrams per day				FISH TOXICITY TEST			FLOW - thousand cubic metres/day	
	1970	1982	% re- duction	1984 * **	1970	1982	% re- duction	1984 * **	1970	1982	1984 **	1970	1982
Domtar @ Rd Rck	16.6	4.8	81.0	4.8	15.1	15.5	(+0.3)	17	lethal	variable		103.7	91.0
Domtar @ St. Cthrs	1.63	0.33	79.8	0.33	.82	.70	15.0	0.70	fail	non-lethal		8.7	10.1
Domtar @ Thrld	.36	.19	47.2	.19	.45	.40	12.5	.4		lethal		2.7	1.0
Domtar @ Trntn	0.64	0.33	48.4	0.33	9.8	3.6	63.3	3.6		lethal		2.2	1.8
Eddy @ Espnla	18.3	5.8	68.4	7.0	20.4	19.3	5.4	3.6	lethal	non-lethal		105.0	90.5
Eddy @ Ottwa	5.3	1.52	71.3	0.5	2.3	1.59	30.9	1.6	fail	pass	pass	16.8	9.9
Fraser @ Thrld	24.6	.95	96.1	1.5	13.3	2.3	75.2	2.3	fail	pass	non-lethal	26.8	22.9
Gr. Lakes @ Drdn	17.8	5.3	70.3	5.6	21.9	14.2	35.2	4.5	lethal	non-lethal		139.0	113.9
Gr. Lakes @ T. Bay	69.7	12.3	82.8	14.0	107.8	81.9	24.0	55.0		lethal		233.0	243.0
James @ Mrthn	9.6	9.7	-		14.5	17.1	(+11.8)			lethal		83.9	81.7

* Limit set by MOE.

** projected

TABLE 4 continued

EFFLUENT QUALITY 1970/1982/1984 - ONTARIO'S PULP AND PAPER INDUSTRY

Mill and Location	TOTAL SUSPENDED SOLIDS Megagrams per day				BIOCHEMICAL OXYGEN DEMAND Megagrams per day				FISH TOXICITY TEST			FLOW - thousand cubic metres/day	
	1970	1982	% re- duction	1984 * **	1970	1982	% re- duction	1984 * **	1970	1982	1984 **	1970	1982
K.C. @ Hnstville	N O T	A P P L I C A B L E			0.02	0.02		0.02	not - applicable			0.3	0.3
K.C. @ St. Cthrs	3.0	2.1	30.0	.26	1.7	0.52	69.4	.39	lethal	non-lethal		12.3	10.0
K.C. @ Trre Bay	2.9	6.58	(+227)	8.5	6.3	32.0	(+510)	45.0		lethal		88.1	122.6
Mac @ Strgn Flis	10.1	1.7	83.2	2.9	65.5	64.4	1.0	64.4		lethal		19.1	10.1
Ontario @ Thrld	13.2	9.6	27.3	6.8	58.2	14.8	74.6	18.1	lethal	non-lethal		101.9	127.8
Spruce @ Kpsksng	106.9	10.0	90.0	8	127.2	76	54.7	30.0	lethal		pass	170.6	116.0
SMP @ SS Marie	17.7	12.0	32.2	2.8	31.6	6.3	80.0	5.2		lethal		74.4	32.0
Strathcona @ Strthcn	0.18	0.04	77.7	0.10	0.18	0.47	(+161)	0.47		lethal		4.0	3.3
Irent @ Gln Mllr	1.63	0.26	84.0	0.28	1.09	0.26		0.28	lethal			12.7	1.6 ^a
TOTALS	455.14	120.58	XXX	98.89	766.57	506.46	XXX	378.86	all fail	7 pass	XXX	1857.4	1560.9

* Limit set by MOE.

** projected

^a Sporadic flow

COMPANY	LOCATION	Control Order				
		Previous	Existing	Expiry Date	Proposed	Maintain Control Only
Abitibi-Price, Inc.	Iroquois Falls	Yes	No		Yes	Yes
Abitibi-Price, Inc.	Sault Ste Marie	Yes	No		Yes	
Abitibi-Price, Inc.	Smooth Rock Falls	Yes	No		Yes	
Abitibi-Price, Inc.	Thunder Bay	Yes	No	Dec. 31, 1982	Yes	
Abitibi-Price, Inc.	Fort William, Thunder Bay	Yes	No	Dec. 31, 1982	Yes	
Abitibi-Price, Inc.	Provincial, Thunder Bay	Yes	No	Dec. 31, 1982	Yes	
The Beaver Wood Fibre Co. Ltd.	Thorold		No		Yes	
Boise Cascade Canada Ltd.	Fort Frances	Yes	Yes*	June 30, 1984		
Boise Cascade Canada Ltd.	Kenora	Yes	Yes*	Sept. 30, 1988		
Domtar Fine Papers Ltd.	Cornwall		Yes	Dec. 31, 1984		
Domtar	Red Rock	No	Yes	Dec. 31, 1984		
Domtar Fine Papers Ltd.	St. Catharines		No		No	Yes
Domtar	Trenton		No		No	
Domtar	Thorold		No		No	
E. B. Eddy	Espanola	No	Yes*	Dec. 31, 1985		
E. B. Eddy	Ottawa	Yes	No		?	
Fraser Inc.	Thorold		No		No	
Great Lakes Forest Products	Dryden	Yes	Yes*	Dec. 31, 1984		
Great Lakes Forest Products	Thunder Bay	Yes	Yes*	June 30, 1985		
James River	Marathon	Yes	Yes*	Dec. 31, 1984	Yes	
Kimberly-Clark of Canada Ltd.	Huntsville	No	No		No	Yes
Kimberly-Clark of Canada Ltd.	St. Catharines		No		No	Yes
Kimberly-Clark of Canada Ltd.	Terrace Bay	Yes	Yes*	Dec. 31, 1987		
MacMillan Bloedel Limited	Sturgeon Falls	Yes	Yes*	No Expiry Date		
Ontario Paper Company Ltd.	Thorold		Yes	Dec. 31, 1983	Yes	
Spruce Falls Power and Paper Co.	Kapuskasing	Yes	Yes*	Dec. 31, 1984		
Strathcona Paper	Strathcona		No		Yes	
Trent Valley Paperboard	Glen Miller		No		No	Yes

* Amended

TABLE 6
MILL SPECIFIC INFORMATION

ONTARIO'S PULP AND PAPER INDUSTRY

<u>Mill/Location</u>		<u>Pages</u>
Abitibi-Price, Inc.	Iroquois Falls	1a & 1b & 1c
Abitibi-Price, Inc.	Sault Ste Marie	2a & 2b & 2c
Abitibi-Price, Inc.	Smooth Rock Falls	3a & 3b & 3c
Abitibi-Price, Inc.	Bare Point, Thunder Bay	4a & 4b & 4c
Abitibi-Price, Inc.	Fort William, Thunder Bay	5a & 5b & 5c
Abitibi-Price Fine Paper	Provincial, Thunder Bay	6a & 6b & 6c
The Beaver Wood Fibre Co. Ltd.	Thorold	7a & 7b & 7c
Boise Cascade Canada Ltd.	Fort Frances	8a & 8b & 8c
Boise Cascade Canada Ltd.	Kenora	9a & 9b & 9c
Domtar Fine Papers Ltd.	Cornwall	10a & 10b & 10c
Domtar Packaging	Red Rock	11a & 11b & 11c
Domtar Fine Papers Ltd.	St. Catharines	12a & 12b & 12c
Domtar Construction Materials Ltd.	Thorold	13a & 13b & 13c
Domtar Packaging	Trenton	14a & 14b & 14c
E. B. Eddy	Espanola	15a & 15b & 15c
E. B. Eddy Forest Products Ltd.	Ottawa	16a & 16b & 16c
Fraser Inc.	Thorold	17a & 17b & 17c
Great Lakes Forest Products	Dryden	18a & 18b & 18c
Great Lakes Forest Products	Thunder Bay	19a & 19b & 19c
James River Marathon Inc.	Marathon	20a & 20b & 20c
Kimberly-Clark of Canada Ltd.	Huntsville	21a & 21b & 21c
Kimberly-Clark of Canada Ltd.	St. Catharines	22a & 22b & 22c
Kimberly-Clark of Canada Ltd.	Terrace Bay	23a & 23b & 23c
MacMillan Bloedel Limited	Sturgeon Falls	24a & 24b & 24c
Ontario Paper Company Ltd.	Thorold	25a & 25b & 25c
Spruce Falls Power and Paper Co.	Kapuskasing	26a & 26b & 26c
Strathcona Paper	Strathcona	27a & 27b & 27c
Trent Valley Paperboard	Glen Miller	28a & 28b & 28c

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Iroquois Falls Division

LOCATION: Iroquois Falls.
I.M.I.S. No: 0000860403

MILL HISTORY:

Construction/start-up date: 1914

This is the largest Abitibi-Price newsprint mill in Ontario. The mill was renovated through replacement of four newsprint machines by one large new machine in 1983. Three old paper machines remain.

Ownership:

Abitibi-Price Inc. is Canadian controlled with the dominant (93%) shareholder being a family owned company, Olympia and York.

Processes/Products:

An integrated mill which pulps softwood logs and chips into newsprint and wrapper paper by the sulphite and stone groundwood processes.

Number of Employees: Mill: 950; Woodlands: 360.

ENVIRONMENTAL HISTORY: Receiving watercourse: Abitibi River
Basin/watershed: Moose River/Arctic.

Although the downstream portions of the river are sparsely settled, the river is popular with campers and canoeists in the summer. Water quality in the Abitibi River below the mill has been degraded by mill discharges, aggravated by low or no flow conditions which are controlled by the company's three hydroelectric power developments, two above and one below the mill. In the past, the river below the mill has suffered impairment from accumulated visible, settleable solids, fluctuating flows and oxygen depletion. A Control Order dated 20 December 1977 required that the river be maintained at or above 2,000 cfs, the suspended solids losses be kept below 20,000 lbs/day, installation of spill control facilities, maintenance of a minimum of 4 mg/L dissolved oxygen in the receiver downstream of mill, compliance with air emission regulations and a report on the mill effluent downstream water quality. All requirements of the Control Order have been complied with.

Residents of Iroquois Falls had complained about soot from the coal burning boilers. This was reduced by changing the fuel from coal to natural gas and by subsequent addition of dust collectors prior to the introduction of Woodex (pelletized wood waste) as the primary fuel.

PROSECUTIONS:

The company was prosecuted unsuccessfully under the OWRC Act in 1976 and the EPA Act in 1980. The 1980 prosecution was unsuccessful because the court did not accept the data presented as evidence due to the inaccuracy of the flow measurement devices at the mill.

EXISTING CONCERNS:

The spent sulphite liquor contains organic compounds that are toxic to fish and exert an oxygen demand in the receiving stream. The existing flow measuring devices are unreliable and there is an inaccuracy of approximately 15% which affects the reliability of monitoring data. The BOD₅ test is recognized as being only accurate to within perhaps $\pm 5\%$ on any single sample as well as being unacceptable for daily effluent monitoring.

FUTURE ACTIONS:

A Control Order is currently in preparation that will address the existing concerns. It will be a uniform approach in agreement with orders being prepared for the other five Abitibi-Price mills.

FINANCIAL ASSISTANCE PROGRAMS:

The Company submitted a capital expenditure program for seven of eight mills in Ontario, for \$182 million of which \$100 million was for Iroquois Falls. A grant of \$7.5 and \$15 millions was received from the Federal and Provincial Governments respectively towards the total company program.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Abitibi Price at Iroquois Falls	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000860403
<u>PRODUCTION DATA:</u>				The Pulp yield is:
<u>Pulping:</u>				
stone groundwood	677	689	660	- groundwood 94% and
arbiso (sodium base) sulphite	204	208	202	- sulphite 66% (assumed).
purchased kraft boxes and cuttings	10	10	5	
<u>Paper/other:</u>				
newsprint	853	870	830	
wrapper paper	38	37	37	
TOTAL	891	907	867	
<u>EFFLUENT DATA:</u>				Company must maintain a minimum flow of water at not less than 2,000 cfs and maintain 4 mg/L of dissolved oxygen in the river.
<u>Flow:</u> thousand cubic metres per day.	98.3	60	60	A continuous dissolved oxygen monitor 43 kilometers downstream from the mill is operational during the summer months.
<u>Biochemical oxygen demand:</u>	53.6	53.6*	53.6*	Nearest water quality station is at tailrace below dam prior to the addition of mill waste: BOD 8.3 mg/l, Fecal Coliform 0.55. Quality of Abitibi River downstream of mill was
<u>Suspended solids:</u>	29.8	4.5	4.9	
<u>Allowables:</u> M.O.E. TSS		9.1	9.1	
BOD		*	*	
<u>Federal:</u> (1971) TSS		Not Specified		
BOD		Not Specified		

evaluated in 1978. BOD must be regulated to avoid exceeding the assimilative capacity of the river.

Ministry is evaluating a company 1983 river study. Federal limits are met. The mixing zone is not defined on the Certificate of Approval.

AIR EMISSIONS:

Emissions of some particulate, sulphur dioxide and nitrogen oxides have never been measured. Odours and sulphur dioxide are emitted during digester blows and from the Acid Plant vent. Particulate from the burning of Woodex pellets and wood refuse has been measured and emissions have been found to comply with provincial regulations. From time to time, in the past, there were some complaints about flyash. Airborne wood dust from the chip piles has not been assessed as a fugitive dust problem.

SOLID WASTES:

Bark, woodwastes and clarifier sludges are used for the refuse boiler. Other solids wastes, such as domestic/office waste, maintenance wastes and some production wastes are sent to either the company's or municipal waste disposal site.

ABATEMENT SYSTEMS:

Bark screens and drainers, groundwood wastewater screens, groundwood reject recovery and sulphite recycling/recovery systems were installed to reduce the total suspended solids load to the clarifiers and subsequently to the river. Two clarifiers were constructed in 1973 as a primary effluent treatment system to reduce the total suspended solids load to the river. Multiclones were installed on the combustion gases from the three solid fuel boilers to remove particulate matter.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Iroquois Falls Division

LOCATION: Iroquois Falls.
I.M.I.S. No: 0000860403

HAZARDOUS CONTAMINANTS:

Water: High organic loading in spent sulphite liquor and woodroom causes the effluent to have an oxygen reducing demand on the river and contains compounds that are toxic to fish. The 1982 LC 50 was 26%.

Air: Emissions do not appear to be a problem.

Solid wastes: The company disposes of solid wastes at a site located on Mill Property. This site has reached its useful capacity and must be closed. The company is to begin the search for a new site. The Town of Iroquois Falls has expressed some concern regarding the existing site.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Each month a report is made on the daily effluent flow, the daily suspended solids, the weekly BOD₅ and the daily newsprint production. These are reported as daily averages averaged over the operating week. The flow measuring device is considered to be in error by $\pm 15\%$. It is checked regularly to ensure that it is operating. A non-proportional composite sample is collected for each day. Daily pH measurements are made and reported in the monthly report. The analytical procedures are acceptable to MOE.

Air: MOE maintains one dustfall jar to monitor ambient air quality. There is no routine air emission report.

Solid wastes: There is no routine reporting of the volume of wastes disposed of at the company site. No landfill management and closeout plans have been filed with MOE.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Abitibi Price at Smooth Rock Falls	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000860502
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> kraft	297.5	299	299	Pulp yield is 45%.
<u>Paper/other:</u> Bleached kraft pulp	297.5	299	299	
TOTAL	297.5	299	299	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day	59.2	47.7	45	Water quality station is 19 kilometers downstream; 1982 arithmetic annual averages: Dissolved Oxygen 7.4; BOD 7.9.
<u>Biochemical oxygen demand:</u>	16.7	7.8	7.0	
<u>Suspended solids:</u>	11.6	3.0	3.0	
<u>Toxicity:</u>	Fail	Fail	Fail	
<u>Allowables:</u> M.O.E. TSS		8.0	8.0	
BOD		3.0	3.0	
<u>Federal:</u> (1971) TSS	Not specified		4.8	
BOD	Not specified		11.5	

Mattagami River quality surveys were made in 1982 and 1983; preliminary analysis indicates that a BOD discharge limit of 3.1 megagrams per day will maintain a 47% dissolved oxygen in the river. Odorous effluent is discharged through a diffuser; condensate stripping has reduced effluent odour.

AIR EMISSIONS:

The mill is a controlled source of particulates, sulphur dioxide, oxides and chlorine dioxide, oxides of nitrogen and total reduced sulphur (TRS) compounds (odours). Emissions from the wood refuse burner, bleach plant, lime kiln, the Teller wet scrubber on the recovery boiler have been stack sampled and must be resampled. Complaints have been received about odours from town residents. There has been an overall partial air emissions survey. An ambient air TRS monitoring survey was conducted by the Ministry from 1980 to 1982 which indicated non-compliance. A new mechanical chip conveyor was installed to reduce wood fines losses.

SOLID WASTES:

Wood wastes, lime dregs, and wood ash are disposed of in the company owned, MOE approved two hectare landfill site. The site has a management and closeout plan and may in future receive other woodwaste and inert solids recovered from the mill process. A new refuse boiler was constructed in 1976.

ABATEMENT SYSTEMS:

The mill has a knot reject recovery, wet bark recovery and primary effluent clarifier to reduce TSS discharge. A foam retention lagoon collects additional solids. Counter current washing and recycle throughout the mill reduces fibre loss. A fibre spill recovery system also reduces fibre loss. Twin diffuser pipes are used to discharge final effluent to the Mattagami River. BOD₅ loadings have been reduced by increased brown stock washing, a black liquor spill control system, additional black liquor storage, foul condensate stripping. Spent sulphuric acid from the bleach plant is presently recovered in the kraft recovery system to raise the depressed pH of the final effluent. A Teller wet flue gas scrubber controls TRS emissions from the recovery boiler. Lime kiln particulates and bleach plant emissions are also controlled by scrubbers. Odorous non-condensable gases are collected and incinerated in the recovery boiler. A wet scrubber is to be added in 1984, to the refuse boiler to control particulate emissions. The mill is experimentally using H₂O₂ and O₂ in the bleach plant to reduce chlorine and ClO₂ demand. Sanitary wastes are collected and treated separately in a R.B.C. Woodwastes are dewatered and burned in the refuse boiler.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.

LOCATION: Smooth Rock Falls.

I.M.I.S. No: 0000860502

MILL HISTORY:

Construction/start-up date: 1918

Originally built as a sulphite mill and converted to kraft pulping in 1965.

Ownership:

Abitibi-Price Inc. is Canadian controlled with the dominant (93%) shareholder being a family owned company, Olympia and York.

Processes/Products:

Logs and chips are converted through the kraft process into bleached and unbleached pulp. 2X4 studs (lumber) are also produced and the chips are used in the kraft mill.

Number of Employees: Mill: 420.

ENVIRONMENTAL HISTORY: Receiving watercourse: Mattagami River
Basin/watershed: To James Bay.

In 1969, a foam retention lagoon was constructed to control discharge through the diffuser pipes to reduce suspended solids discharged. In 1972, a Program Approval was issued requiring the control of particulates and TRS from the lime kiln, multiple effect evaporator, digester relief vent and recovery boiler. In 1974, an amended program was issued to include collection of non-condensable gases with incineration in the lime kiln, stack testing and the stripping of foul condensate to improve effluent quality. In 1975, diffuser pipes were extended, a primary effluent clarifier was constructed to reduce TSS in the woodroom effluent with dewatering and burning of sludge in the refuse boiler.

In 1977, a Control Order was served on the company requiring the reduction of TRS emissions from the recovery boiler, evaporation stream stripping of foul condensate, an evaluation of the impact of mill effluent on the Mattagami River, incineration of non-condensable gases, steam stripping of foul condensate, stack testing of all main emission points, the separation and treatment of domestic sewage, additional brown stock washers, additional evaporators, and the submission of monthly samples.

The Order was amended in 1980 to extend deadlines for construction of abatement equipment due to a labour dispute. The amended Order also required a black liquor spill control system, a bark fibre recovery system and an improved bark fines and sludge handling system. A fibre spill recovery system was also installed. All items were complied with by December 1983.

Although river surveys since 1969 indicated improved water quality, toxicity testing show little improvement. A 1982 survey indicated fish tainting as far as 5 kilometers downstream.

Intensive monitoring of downstream dissolved oxygen have recorded instances when the concentration has dropped below 47% during critical low flow conditions.

PROSECUTIONS:

Prosecuted under Section 27, OWRC Act; found guilty and fined in 1970 a total of \$2,000.

EXISTING CONCERNS:

The Mattagami River presently receives a large discharge of extremely toxic effluent which has the ability to taint fish flesh at sub-lethal concentrations. BOD₅ discharge from the mill may depress the dissolved oxygen concentration below 47% during the critical flow conditions. Excessive TRS emissions have been measured and complaints of chlorine and chlorine dioxide emissions have been received. The existing method used to measure final effluent flow has questionable accuracy and poor precision.

FUTURE ACTIONS:

A Control Order is currently in preparation. It will be a uniform approach with concurrent orders being prepared for the other five Abitibi-Price mills.

FINANCIAL ASSISTANCE PROGRAMS:

The Company submitted a capital expenditure program for seven of eight mills in Ontario, for \$182 million of which \$10.9 million was for Smooth Rock Falls. A grant of \$7.5 and \$15 millions was received from the Federal and Provincial Governments respectively.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.

LOCATION: Smooth Rock Falls.
I.M.I.S. No: 0000860502

HAZARDOUS CONTAMINANTS:

Water: Chlorinated organics and possibly toxic metal compounds are being discharged into the Mattagami River. Published research has found bleachery waste streams to exhibit genotoxic and suspected carcinogenic activity.

Air: Not known. If any, they will be from the recovery furnace, bleach plant or other fugitive sources.

Solid wastes: Leachate of unknown composition is being generated by the waste disposal site.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: The mill voluntarily reports monthly averages for BOD₅, TSS, DS, flow, production and pH. BOD₅ is done twice weekly. Composite samples are taken on a fix time basis. Flow measurement is not considered reliable. Conductivity measurements are made continuously but not reported. All tests are conducted according to the CPPA standards. Dissolved oxygen levels will be measured about and below the mill. Proposed changes include more frequent BOD₅ or comparable analysis, and flow proportionate sampling.

Air: The continuous TRS monitor in the recovery furnace stack does not accurately measure concentrations at all times. Grab samples from this source are analyzed using a gas chromatograph. The mill intends to install a continuous recording ambient air TRS monitors.

The mill does not presently submit any air data on a monthly basis. The mill owns stack sampling equipment and intends to have staff trained according to Ministry procedures. Chlorine dioxide discharge from the bleach plant scrubber is measured continuously. The accuracy of this device is unknown. The wind direction and velocity at the mill are presently visually assessed.

Solid wastes: The new Control Order will require reporting of the amount and type of materials landfilled and the monitoring of leachate leaving the site. Native clay soils preclude any groundwater impact from this leachate. Management and close-out plans have been prepared for this site. Covering is inadequate and the mill has been directed to cover more frequently. Foam lagoon dredge spoils will be landfilled following dewatering in a settling basin. Decant from this basin will be directed to the foam lagoon.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Thunder Bay Division, (Bare Point Mill)

LOCATION: Thunder Bay.
I.M.I.S. No: 0000860007

MILL HISTORY:

Construction/start-up date: 1926

The company has undergone several reorganizations which have affected the names and corporate roles of the Thunder Bay mills. Abitibi-Price operates two newsprint mills and one fine paper mill in the City of Thunder Bay. Only Thunder Bay Division still produces sulphite pulp.

Ownership:

Abitibi-Price Inc. is Canadian controlled with the dominant (93%) shareholder being a family-owned company, Olympia and York.

Processes/Products:

Thunder Bay Division produces newsprint, which is comprised of 74% groundwood and 26% sulphite pulp. The sulphite mill using the Arbiso process, has a yield of approximately 65%.

Number of Employees: Mill: 325; Woodland: 330.

ENVIRONMENTAL HISTORY: Receiving watercourse: Thunder Bay, Lake Superior.
Basin/watershed: Great Lakes System.

Water quality surveys indicate that the company's wastewater discharges have an effect upon Lake Superior. There has been an ongoing discussion between M.O.E. and the company about the need for further treatment of the company's wastewater.

The emissions of SO₂ from the sulphite mill are not considered to be of major concern.

The company was issued a Control Order which expired December 31, 1983. The BOD reduction clause required the company to reduce BOD discharges, such that the BOD discharged from the three mills did not exceed a specified limit. On the expiry of the Order, all items within it had been complied with. A primary clarifier was installed.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The effluent from the complex is lethal to fish due to the discharge of a heavy organic loading.

FUTURE ACTIONS:

A Control Order is currently in preparation. It will be a uniform approach in agreement with concurrent orders being prepared for the other five Abitibi-Price mills. Specified BOD and suspended solids loadings in the total mill effluent will be required. The company will be required to address effluent toxicity.

FINANCIAL ASSISTANCE PROGRAMS:

The Company submitted a capital expenditure program for seven of eight mills in Ontario, for \$182 million of which \$5.9 million was spent at the Thunder Bay Division. A total of \$22.5 million was received from the Federal and Provincial Governments; Ontario gave \$15 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Abitibi Price Thunder Bay Division	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000860007
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> sulphite stone groundwood	105 316	107 307	108 312	Pulping yields are 65% for sulphite and 95% for groundwood.
<u>Paper/other:</u> newsprint	421	414	420	
TOTAL	421	414	420	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day	44.5	29.9		I.E.C. Beak undertook a survey of the receiving water body in 1981 which confirmed that a Dissolved Oxygen sag does exist close to the mill operation. A water quality monitoring station is located approximately 0.5 km off shore from the mill complex: 1982 results - TSS 120; D.O. 8.1; BOD 3.9; Fecal coliform 97. Although the effluent is
<u>Biochemical oxygen demand:</u>	24.2	19.8	20.0	
<u>Suspended solids:</u>	1.9	1.0	1.5	
<u>Fish Toxicity:</u>	Lethal since 1968.			
<u>Allowables:</u> M.O.E. - TSS		7.5		
BOD		14.6		
<u>Federal:</u> (1971) - TSS		9.7		
BOD		41.4		

there are no foam or odour problems. There are no groundwater problems. There are no groundwater wells around the settling lagoons. Toxicity testing is done by MOE.

AIR EMISSIONS:

Cyclones remove airborne particulate from the two natural gas/coal/wood refuse burning boilers. An air emissions inventory has never been made. The company has a scrubber on its vomit stack to lessen emissions of SO₂. There are no ambient air monitors around the mill.

SOLID WASTES:

Company landfill is on mill property (A590137). The bark fines together with the clarifier sludge are burned. The company landfills its dredge spoils from the lagoons.

ABATEMENT SYSTEMS:

The company has installed spill collection systems throughout the mill to minimize losses. A 65-foot diameter clarifier was installed to treat high solid streams in 1981-82. All wastewaters are discharged into one of two parallel lagoons of 2.75 acres each for solids removal prior to discharge to Lake Superior; these settling lagoons were installed in 1970-71.

Sanitary wastes are segregated and treated on-site in a MOE approved facility.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Thunder Bay Division, (Bare Point Mill)

LOCATION: Thunder Bay.
I.M.I.S. No: 0000860007

HAZARDOUS CONTAMINANTS:

Water: The high organic loading in spent sulphite liquor contains compounds that are toxic to fish.

Air: Emissions are not considered to be a problem.

Solid wastes: No problem is evident. Wastes are being properly disposed of at a MOE approved landfill site.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Flow, pH and TSS are done daily. BOD₅ is done once per week. MOE audit samples are taken every month. Accuracy of flow measurement is unknown; there is no routine calibration or annual flow verification.

C.P.P.A. analytical methods are used. Monthly average for TSS, BOD, flow measurement and saleable production is reported to MOE. Samples are taken on a timed basis but are not flow proportioned. Daily quality data on the discharge from the lagoons to the Bay are submitted to MOE.

Air: No routine air monitoring is done.

Solid wastes: Company maintains a record of wastes quantities. Management and closeout plans have been filed with the Ministry. No monthly report of landfill quantities is sent to MOE.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Fort William Division
(Mission River Mill)

LOCATION: Ft. Wm. Mill, Thunder Bay.
I.M.I.S. No: 0000860205

MILL HISTORY:

Construction/start-up date: 1921

The mill was originally constructed as a groundwood mill. Prior to December 1981, the company operated both a groundwood and sulphite pulping operation. In December 1981, the company abandoned the sulphite process and started the SCMP process.

Ownership:

Abitibi-Price Inc. is Canadian controlled with the dominant (93%) shareholder being a family owned company, Olympia and York.

Processes/Products:

Newsprint is made by converting logs and chips through the use of stone groundwood and the new Sulphonated Chemi-Mechanical Pulping process which was started up in December 1981. Kraft pulp is added to these two pulps for strength in the newsprint.

Number of Employees: Mill: 300.

ENVIRONMENTAL HISTORY: Receiving watercourse: Thunder Bay
Basin/watershed: Great Lakes Basin.

The company's latest Control Order was issued in September 1979 and ended in December 1982. This Control Order required the three Abitibi mills to reduce in total the BOD loading from the mills to 39 tons per day and to reduce Total Suspended Solids to a 50 ppm concentration in their individual mill effluents. During the 1975 pulp and paper strike, water quality improved in the inner harbour. The amount of organics in the effluent was reduced when the sulphite process was replaced by the SCMP process.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The company-predicted BOD reduction due to the process changes has been achieved. Research is needed to characterize the effluent from the SCMP process so that its toxicity is better understood.

FUTURE ACTIONS:

A Control Order is currently in preparation. It will be a uniform approach in agreement with concurrent orders being prepared for the other five Abitibi-Price mills. Specific limits for BOD and total suspended solids will be set for the mill.

FINANCIAL ASSISTANCE PROGRAMS:

The Company submitted a capital expenditure program for seven of eight mills in Ontario, for \$182 million of which \$25.4 million was spent at the Ft. Wm. Mill, Thunder Bay. A total of \$22.5 million was received from the Federal and Provincial Governments; Ontario gave \$15 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Abitibi Price Fort William Division	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000860205
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u>				Pulp yield are:
stone groundwood	260	210	235	groundwood 95%
sulphonated chemical				sulphonated chemical 92%
mechanical pulp	-	90	122	Newsprint formula:
sulphite pulp	76	shutdown		
purchased pulp	-	20	22	SCMP 32%
				stone groundwood 62%
<u>Paper/other:</u>				kraft 6%
newsprint	336		379	
TOTAL	336	320	379	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day	25.1	22.6	22.6	Water quality station 1982 data: TSS 79.01; D.O. 10.5; BOD 0.8; Bacteria - Total Coliform 366; Fecal coliform 34.
<u>Biochemical oxygen demand:</u>	23.0	10.2	10.2	
<u>Suspended solids:</u>	1.0	1.2	1.2	In 1982, I.E.C. Beak made a Dissolved Oxygen and phenolic compound survey of the receiving water quality.
<u>Fish Toxicity:</u>	Lethal since 1968			This survey confirms that the company's effluent has an adverse although limited impact on the inner harbour.
<u>Allowables:</u> M.O.E. TSS		1.2	1.2	
BOD		11.0	11.0	
<u>Federal:</u> (1971) TSS		6.8	6.8	
BOD		29.0	29.0	

Toxicity testing is done by MOE. Although the effluent is discharged to the surface waters, there are no foam or odour problems. The mixing zone would vary greatly depending upon the parameter.

AIR EMISSIONS:

There are no ambient air monitors around the mill. Few complaints had been received about sulphite odours; this process is now shut down. An air emissions inventory will be requested in the next Control Order. Although chips are stored in piles, there does not appear to be a fugitive problem.

SOLID WASTES:

Waste is being landfilled on mill property at a MOE certified site (A590134). Bark fines and clarifier sludges are burned.

ABATEMENT SYSTEMS:

The BOD was reduced by 12 megagrams a day when the sulphite process was shutdown and the SCMP mill started up. Sand is removed separately from woodroom effluent as part of bark recovery. A 65-foot clarifier treats the high fibre stream from the woodroom prior to discharge into a settling pond. It is then discharged into Lake Superior. The main mill effluent (paper machines, etc.) is discharged into a settling lagoon prior to discharge into Lake Superior. The settling lagoons were installed in 1969-1972. A primary clarifier was installed during 1980-81. Sanitary wastes are segregated and treated by an approved facility.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Fort William Division
(Mission River Mill)

LOCATION: Ft. Wm. Mill, Thunder Bay.
I.M.I.S. No: 0000860205

HAZARDOUS CONTAMINANTS:

Water: Organics in the effluent need to be identified and quantified before an evaluation can be made.

Air: No problem is evident.

Solid wastes: No problem is evident. The company has prepared a site management plan.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Daily flow, pH and TSS are done. BOD₅ is done once per week. MOE audit samples are taken every month. There are no groundwater wells around the settling lagoon.

Each month, a report is submitted on the previous month's effluent quality -- TSS (daily), flow (daily), BOD₅ (a 7-day composite) and saleable production (daily).

Samples are fixed time portions but not proportional to flow. Flow measurement accuracy is checked periodically; no annual calibration or verification is done.

C.P.P.A. standard analytical methods are used.

Air: There are no in-stack monitors for opacity at the bark boiler or for sulphur dioxide from the Sulphonated Chemical Mechanical Process.

Solid wastes: Company records but does not report the number of truckloads to its own landfill site. Management and closeout plans have been filed with MOE.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Abitibi Price Inc. Provincial Papers		1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 000860106
<u>PRODUCTION DATA:</u>					Groundwood pulp yield is 95%. Coatings are 18% of saleable product, 37% groundwood pulp and 45% purchased pulp.
<u>Pulping:</u>					
stone groundwood		131	123	126	
purchased pulp			102	153	
coatings (clay, starch)			50	61	
sulphite		100	Shutdown		
<u>Paper/other:</u>					
fine and coated papers		231 38	275	340	
TOTAL		231	275	340	
<u>EFFLUENT DATA:</u>					The nearest water quality station is located approximately 0.5 km off shore from the mill - 1982 arithmetic annual mean - D.O. 10.0; BOD 5.0; 1982 geometric mean - total coliform 162; fecal coliform 17. Toxicity testing is done by MOE. Company has made a Dissolved Oxygen and phenolic compounds water surveys. There
<u>Flow:</u> thousand cubic metres per day		93.3	47.9	50.0	
<u>Biochemical oxygen demand:</u>		48.5	3.2	4.0	
<u>Suspended solids:</u>		5.0	1.5	2.0	
<u>Fish Toxicity:</u>		Lethal	Non-lethal since 1980		
<u>Allowables:</u> M.O.E.		BOD	4.0	4.0	
		TSS	2.0	2.0	
<u>Federal:</u> (1971)		BOD	2.9		
		TSS	4.6		

the settling lagoons. Although the effluent is discharged to the surface, there are no foam or odour problems.

AIR EMISSIONS:

Air emissions have never been measured and no inventory was developed. Emissions of suspended particulate matter occasionally exceed ministry regulations.

SOLID WASTES:

Are sent to a Ministry approved landfill site owned by the company (A590101). These wastes consist of lagoon spoils, clarifier sludge and other wood wastes.

ABATEMENT SYSTEMS:

Conventional primary control of effluent and an internal waste coating recovery system. The company has in place a 75-foot diameter clarifier to treat high suspended solids streams. All of the mill effluent is directed into a settling lagoon prior to its discharge into Lake Superior. Settling lagoon was installed in 1970-71. Sanitary wastes are segregated and treated in a rotor-disc system prior to discharge into the settling lagoon.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Provincial Papers (Port Arthur)

LOCATION: Thunder Bay.
I.M.I.S. No: 000860106

MILL HISTORY:

Construction/start-up date: 1919

The mill was constructed as a sulphite pulp mill in 1919 and began paper production in 1922. Stone groundwood pulping is in operation but the sulphite mill was shut down in 1978. In 1983, the sales and Head Office of Fine Papers were moved from Toronto to Thunder Bay.

Ownership:

Abitibi-Price Inc. is Canadian controlled with the dominant (93%) shareholder being a family-owned company, Olympia and York.

Processes/Products:

Fine papers are made from groundwood pulp and purchased pulp. The product contains approximately 18% by weight starches and clays; 37% groundwood and 45% purchased pulp.

Number of Employees: Mill: 960.

ENVIRONMENTAL HISTORY: Receiving watercourse: Thunder Bay.
Basin/watershed: Lake Superior.

A Control Order was issued to the predecessor company, Abitibi Forest Products Limited, on November 24, 1977 to separate and treat sanitary sewage, reduce BOD₅ contributions by the three Abitibi Mills in Thunder Bay to 39 TPD and reduce TSS concentration to 50 ppm in the total mill effluent. Amending Control Orders issued to Abitibi Paper Co. Ltd. for the other two mills changed the target date for implementation of the aggregate BOD₅ loading from June 30, 1978 to December 31, 1982.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The plume is highly visible due to clays and starches in the effluent. Atmospheric emissions of suspended particulate matter on occasion exceed the opacity Regulation limit.

FUTURE ACTIONS:

A Control Order is currently in preparation. Unlike the previous Order, each Abitibi mill will be given specified loading limits. Provincial will also be required to comply with the existing opacity limit.

FINANCIAL ASSISTANCE PROGRAMS:

The Company submitted a capital expenditure program for seven of eight mills in Ontario, for \$182 million of which \$28.1 million was spent at this mill. A total of \$22.5 million was received from the Federal and Provincial Governments; Ontario gave \$15 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Abitibi Price, Inc.
Provincial Papers (Port Arthur)

LOCATION: Thunder Bay.
I.M.I.S. No: 000860106

HAZARDOUS CONTAMINANTS:

Water: A 1972 Ministry survey indicated a significant shift in the species composition of aquatic organism in the vicinity of the outfall. There is a Dissolved Oxygen sag in the receiving water body close by the mill. However, it is debatable if any serious impact is occurring.

Air: No problem is evident.

Solid wastes: There is no problem with solid waste at this mill site.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

The flow measurement device is not calibrated or independently checked each year, but is checked when thought to be necessary by the company.

Water: Daily measurement of flow, pH, BOD and TSS are made. MOE audit samples are taken every month. Samples are composited by time, but not flow proportional. CPPA analytical methods are used.

Air: No routine in-stack monitoring is done and thus no air report is submitted.

Solid wastes: Mill maintains a record of truckloads to landfill but does not submit a monthly report. Random measurements of clay, fibre and water content are made of the wastes by the company.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: The Beaver Wood Fibre Co. Ltd.

LOCATION: Thorold.

I.M.I.S. No: 0001620004

MILL HISTORY:

Construction/start-up date: 1914

Newsprint was produced from stone groundwood pulping and purchased pulp. Newsprint production ceased in 1976 and the newsprint machine was sold. Groundwood pulping from debarked cordwood ceased in 1976, also.

Ownership:

The Beaver Wood Fibre Company is a wholly-owned subsidiary of the U.S. Georgia Pacific Corporation, headquarters at Atlanta, Georgia.

Processes/Products:

Paperboard is made from purchased off-specification pulp and waste paper.

Number of Employees: Mill: 250.

ENVIRONMENTAL HISTORY: Receiving watercourse: Beaverdams Creek, Lake Gibson.
Basin/watershed: Twelve Mile Creek, Lake Ontario.

Every summer Ontario Hydro lowers the level of Lake Gibson and the aesthetic problem becomes highly visible. The steps mentioned before in the mill history section allowed the mill to meet most Ministry requirements in the Control Order issued 12 Sept. 1977. The amended Control Order was issued in November, 1979, to cover the shutdown of the newsprint machine. Control Order expired December 31, 1979. Company met all requirements. A further consideration would be the piping of effluent directly to the Old Welland Canal or the existing Welland Ship Canal to improve the aesthetics of Beaverdams Creek and Lake Gibson.

PROSECUTIONS:

Prosecuted under section 27(1) O.W.R.A. and convicted June 1970 - fine \$700.

EXISTING CONCERNS:

Foam and odour make the Beaverdam Creek unattractive as a future tourist attraction. This should be included in the solution to the aesthetic problem of the Old Welland Canal. Effluent surges cause a high torque at the clarifier; to protect clarifier, effluent might by-pass clarifier and exceed TSS limit.

FUTURE ACTIONS:

To reduce further both the solids and BOD to 15 p.p.m. and to control the generation of foam in Beaverdam Creek. The City of St. Catharines is considering the use of Lake Gibson as their source of drinking water. A second clarifier may be required to handle scheduled clarifier maintenance or a clarifier emergency shutdown. To contain surges, mill is modifying stack chest with a completion date of December 1984.

FINANCIAL ASSISTANCE PROGRAMS:

None - company did not apply.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Beaver Wood Fibre	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> 100 % waste paper repulping stone groundwood	- 80	275 shutdown	262	Wastepaper is recycled. There is no deinking process.
<u>Paper/other:</u> newsprint paper board	103 167	ceased production 245	262	
TOTAL	270	275	262	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day	23	13.27	14.5	Sanitary wastes are treated by the city of Thorold. In mill spill handling of broke and screen rejects. Systems were installed. Clarifier removes TSS. Switch from pulping to purchased pulp reduced BOD ₅ . Duplicate sludge and mill effluent pumping systems were installed. Water quality station is 10 miles away at Wellandvale Ave.
<u>Biochemical oxygen demand:</u>	4.9	2.0	1.9	
<u>Suspended solids:</u>	9.3	.78	.8	
<u>Toxicity:</u>	Fail	Pass	non lethal	
<u>Allowables:</u> M.O.E. TSS		1.0*	1.7	
BOD		2.7*	.8	
<u>Federal:</u> (1971) TSS		2.06	1.9	
BOD		2.0	2.0	

St. Catharines monitors effluent from all pulp and paper mills in the Niagara Area - 1982 data - TSS 207; D.O. 11.8; total coliform 8,045; fecal coliform 901. Effluent is discharged direct to Beaverdams Creek where it is highly visible due to odour and foam. Beaverdams Creek enters Gibson Lake via a syphon under the Welland Ship Canal. Syphon is flushed twice a year. The 50 ppm TSS is achievable by adding costly polymer. In 1982, the effluent was scanned for trace metals, phenols, PCB and pesticides.

* rounded numbers.

AIR EMISSIONS:

Particulate, oxides of nitrogen and sulphur dioxide have never been measured. Visibility problem caused by steam from paperboard machine (drying section) was corrected by a stack extension. Boiler was converted to natural gas to eliminate SO₂ emissions. Air emissions are calculated and are based on fuel usage and pollution factors for combustion oxides of nitrogen 51.4 megagrams per year and 2.6 megagrams per year sulphur dioxide. No ambient air monitoring is needed. An emission survey and inventory is not required.

SOLID WASTES:

General rubbish is sent to Walker's Quarry, a Ministry approved landfill operation. Clarifier sludge is recycled to the stock system.

ABATEMENT SYSTEMS:

Water recycle at paper machine is used to reduce TSS before final clarifier.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Boise Cascade Canada Ltd.

LOCATION: Fort Frances.
I.M.I.S. No: 0000870105

MILL HISTORY:

Construction/start-up date: 1914

The first pulping process was groundwood. A 500 ton/day kraft mill was added in 1971.

Ownership:

Company is a wholly owned subsidiary of the Boise Cascade Corporation, U.S.A., headquartered at Boise, Idaho. The name was changed from Ontario Minnesota Pulp and Paper in 1978. In 1983 a corporate office was set up in Toronto. Across the river at International Falls is a pulp and papermaking complex also owned by Boise Cascade. The air shed and river are shared by these two Boise mills. The Boise Cascade mill in International Falls has operated major secondary treatment systems since year end 1981.

Processes/Products:

This integrated mill produces fully bleached and semi-bleached softwood kraft pulp and groundwood speciality printing papers from logs and chips.

Number of Employees: Mill: 886.

ENVIRONMENTAL HISTORY: Receiving watercourse: Rainy River
Basin/watershed: Lake of-the-Woods/Arctic

Problems with particulate and gaseous emissions have occurred since 1971. There have been numerous reports of vegetation damage and material discomfort to people. At times gaseous emissions have been at levels considered to be hazardous to the health of susceptible individuals or groups, although documentation from Fort Frances health authorities is not available. The toxicity of the total mill effluent decreased during 1982 but is still lethal to fish. This was due to improved in-plant controls (more spill control, better pH control) and increased aeration in the secondary treatment system. Improvements have been noted in air quality since 1980 and are expected to continue until completion of the Control Order which was issued May 16, 1981.

PROSECUTIONS:

Ministry prosecuted the company for excessive air emissions in 1975; the company was found guilty and fined \$1,800. A Control Order was issued May 16, 1980. The company was prosecuted for failure to comply with certain requirements of the Control Order in 1980 and fined \$5,000.

EXISTING CONCERNS:

A major portion of the Rainy River is unfit for water contact recreation because of the mills' discharge and agricultural wastes. Excessive bacterial loadings may require further evaluation. First chlorination stage effluents have given positive indication of carcinogenicity or mutagenicity. A large Boise Cascade pulp and paper plant in International Falls, Minnesota, also discharges treated effluents to the receiving stream. A 1969 water quality survey, made for the I.J.C. Rainy River Water Pollution Board, found that the river could handle a maximum BOD loading of 70,000 lbs/day from all sources. The lethality of the treated effluent is variable reflecting shock loading to the secondary treatment system. Blowing foam from the lagoons is a problem. Mill is still a source of odour problems. Research is needed on the fate of chlorinated organics in the receiving waters.

FUTURE ACTIONS:

Mill must comply with the existing Control Order. An investigation may be needed to define the variation in feed to the aerated stabilization lagoon to determine its ability to remove persistent toxic substances under varying seasonal conditions.

FINANCIAL ASSISTANCE PROGRAMS:

The Company received \$20 million as an incentive to modernize its Kenora and Fort Frances mills. The Province put up \$13.3 million, Federal share, \$6.7 million. The company changed its plan for Fort Frances and agreed to increase its capital investment at Fort Frances to \$60.6 million (1978 dollars).

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: The Beaver Wood Fibre Co. Ltd.

LOCATION: Thorold.
I.M.I.S. No: 0001620004

HAZARDOUS CONTAMINANTS:

Water: Bacteria might be a concern.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Monthly report is submitted of average per month. Sample is composited on a timed basis not proportional to flow. Daily flow, pH and TSS measurements are made. BOD₅ is measured three times per week. MOE effluent audit is once per month. Flow measurement device has not been calibrated nor checked by independent means on an annual basis.

Air: Report is not required; insignificant emissions are combustion gases only.

Solid wastes: General rubbish is sent to Walker's landfill and company maintains an internal record.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Boise Cascade Canada Ltd. at Fort Frances.	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000870105
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u>				Groundwood pulp yield is 95%. Yield of bleached kraft pulp is 45%.
groundwood pulp	424	537	615	
bleached and unbleached kraft pulp	-	450	450	
<u>Paper/other:</u>				
kraft pulp		403	450	
groundwood specialities	424	584	615	
TOTAL	424	987	1,065	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	32	72.2	67	Nearest water quality station on Rainy River is about 4 miles downstream of mill. 1982 data was as follows: D.O. 9.7, BOD 1.0, TSS 9.8 (all mg./l.).
<u>Biochemical oxygen demand:</u>	8.2	12.2	11.8	Rainy River Water Pollution Board had a Dissolved Oxygen survey made in 1969 to establish the BOD load.
<u>Suspended solids:</u>	4.9	7.8	7.2	Toxicity testing is done by MOE.
<u>Fish Toxicity:</u>	lethal	variable		Blowing foam from the secondary effluent treatment was a
<u>Allowables:</u> M.O.E. TSS		7.5	7.5	
BOD		15.0	10.0	
<u>Federal:</u> (1971) TSS		33.6	33.6	
BOD		64.0	64.0	

problem perhaps due to condensates, soap or turpentine in the untreated effluent. The Effluent is discharged to a diffuser outfall.

AIR EMISSIONS:

Mill is a controlled source of particulates, odours (Total Reduced Sulphur Compounds), oxides of nitrogen and sulphur dioxide. Dustfall and sulphation rates are measured monthly at 7 sites in Fort Frances with continuous monitors for TRS at two sites. Routine stack sampling for particulate emissions from the lime kiln and recovery boiler are undertaken monthly by the company. The ambient TRS monitor closest to the mill is telemetered into the mill control room. Stack sampling for TRS on a grab basis is occasionally undertaken by the company. A continuous particulate monitor is used on the recovery stack. An emission inventory based on actual stack sampling is a Control Order requirement. Blowing wood fines from fugitive sources such as the chip piles remains an occasional problem. In September 1983, the paper mill clarifier effluent was diverted to the aeration pond; this change appears to have reduced foam from the aeration pond. Few complaints of blowing foam have been received in 1984.

SOLID WASTES:

Bark, commercial wastes, lime, clarifier sludge, and basin sludge are disposed at a MOE certified site (A 610101). Most of the bark is burned at the sister mill in International Falls, Minnesota, for steam generation. Disposal site (A7104801) will be closed in 1984.

ABATEMENT SYSTEMS:

Air emissions are controlled by scrubbers on the lime kiln stack, the bleach plant vent (September, 1983), the tall oil reactor vent, and the smelt dissolving tank vent; electrostatic precipitator on the low-odour recovery boiler; water sprays on the pneumatic chip system; cyclones on the digester fill system; thermal oxidation of NCG's from the digester blow system, the digester relief system and the evaporator off-gases (September, 1983). Kraft mill uses a low odour recovery boiler to control potentially the largest source of odours.

Effluent treatment systems consist of a bark fines system with clarifier on wet woodroom effluent; primary settling and aeration basins for bark fines clarifier and kraft mill effluents; disk filter, saveall and primary clarifier for paper mill effluent; segregation of uncontaminated vacuum seal waters; primary and secondary treatment of the total effluent after September, 1983. A clarifier treats paper mill effluent, the primary-aeration basins treat kraft mill, the wet woodroom and clarified paper machine effluents.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Boise Cascade Canada Ltd.

LOCATION: Fort Frances.
I.M.I.S. No: 0000870105

HAZARDOUS CONTAMINANTS:

Water: Published research has found various waste bleachery streams to exhibit genotoxic and suspected carcinogenic activity.

Air: Fugitive emissions may be an occasional problem.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Effluent report is submitted monthly. Flow weir has not been calibrated and checked independently. Sample is composited on a time basis but not flow proportioned. Industry's analytical methods are used.

Water: Daily measurement is made of the flow, Total Suspended Solids and Biological Oxygen Demand and pH. The effluent is audited about once a month by MOE. Monitoring of the temperature surveillance wells around secondary pond is done.

Air: Monthly stack testing is done for particulate and occasional stack testing for Total Reduced Sulphur compounds. This data is not sent to MOE each month although it is available at the mill.

Solid wastes: Summer sampling and measurement of Biochemical Oxygen Demand, sodium, Total Dissolved Solids of the drainage from the waste disposal site and the surveillance wells is done by the mill and audited about once every two months by MOE. Management and closeout plans have been submitted for site A7104801. Active investigation of alternate disposal sites is underway.

STATUS REPORT
ONTARIO PULP AND PAPER INDUSTRY

NAME: Boise Cascade Canada Ltd.

LOCATION: Kenora.
I.M.I.S. No: 0000870006

MILL HISTORY:

Construction/start-up date: 1924

This mill has grown from a lumbering operation to the present 3-machine newsprint operation furnished with sulphite and groundwood pulp produced on site.

Ownership:

This company is a wholly owned subsidiary of Boise Cascade Corporation, U.S.A., headquartered at Boise, Idaho. The name was changed from Ontario Minnesota Pulp and Paper in 1978. In 1983 a corporate office was set up in Toronto.

Processes/Products:

Newsprint is presently made from logs and chips by the stone groundwood and sulphite processes respectively with some purchased softwood kraft. The company had operated a sawmill in Kenora which was destroyed by fire in 1984.

Number of Employees: Mill: 879 to 370 in 1986.

ENVIRONMENTAL HISTORY: Receiving watercourse: Winnipeg River
Basin/watershed: Lake Winnipeg/Arctic watershed

A Control Order was issued on April 27, 1978, subsequently amended August 14, 1979 and revoked by issue of a Control Order dated April 20, 1982. A labour dispute in 1978-79 necessitated the amendment. The Company had complied with requirements until the Incentive Program brought with it further process changes. A new Control Order was issued in June 1984.

There has been a number of problems associated with vegetation damage and odours from SO₂ emissions, soot and dust deposition, visibility problems for motorists from steam and noise and vibration from the woodroom.

A "Teepee" wood residue burner at the sawmill was shutdown when the fluidized bed wood waste furnace was started up in 1977.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The new Order reflects abatement pollution sources causing occasional complaints regarding SO₂ and particulate emissions. TSS effluent levels are to be reduced to 4.5 metric TPD from the present limit of 6.0 metric TPD. Other potential concerns regarding noise and vibration arising from the operation of the modernized facility are also addressed in the Order.

Replacement of the two existing processes has been deferred for the foreseeable future. The effluent is currently toxic to fish and has a low pH.

FUTURE ACTIONS:

The Ministry of the Environment will ensure compliance with the terms of the new Order. Future BOD₅ loading limits are well within the assimilative capacity of the river. Future study of effluent toxicity from the modernized plant is required.

FINANCIAL ASSISTANCE PROGRAMS:

The company received a \$20 million incentive grant for Kenora and Fort Frances. However, the company had second thoughts about changing the pulping processes from groundwood and sulphite to thermal mechanical pulping. Expenditures were stopped for these deliberations. Since the company was already using the grant money, the capital expenditures at Kenora were increased to \$181.6 million and the groundwood/sulphite combination was kept.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Boise Cascade Canada Ltd. at Kenora	1970	1982	1984	Comments
	Megagrams/day		Forecast	I.M.I.S. No: 0000870006
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u>				Sodium based sulphite mill is operated at 69% yield. Groundwood yields is 95%. Some coloured papers are produced.
stone groundwood pulp	167	513	511	
sodium based sulphite pulp	-	204	213	
<u>Paper/other:</u>				
newsprint	658	668	721	
TOTAL	658	668	721	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	53.2	63.8	60.5	The Nearest water quality station on the Winnipeg River, is about 1/2 mile downstream of the mill, 1982 data is as follows: D.O. 9.9, BOD 2.7, TSS 4.1 (all mg./l.). There are several fishing camps downstream. Beak Consultants at the company's expense made a water quality survey in 1977 and found exceptionally high dissolved oxygen levels in the Winnipeg River under low flow conditions.
<u>Biochemical oxygen demand:</u>	33.4	33.0	28.6	
<u>Suspended solids:</u>	8.5	6.8	5.9	
<u>Fish Toxicity:</u>	Lethal since 1968.			
<u>Allowables:</u> M.O.E. TSS		7.5	6.0	
BOD		none	44.0	
<u>Federal:</u> (1971) TSS		15.7		
BOD		66.8		

conditions. At low flow summer conditions, the BOD in the effluent would depress the D.O. by 1 mg/l. Toxicity is done by MOE. No foam or odour problem have been encountered with this effluent.

AIR EMISSIONS:

Boiler plant # 1 and 2 emits particulates at the rate of 400 to 600 kilograms/day, sulphur dioxide - 500 to 600, and oxides of nitrogen - 50 (calculated values).

Dustfall and sulphation rates are measured monthly at 4 sites in Kenora. Stack sampling for SO₂ concentration in the acid tower vent is done once every 8 hours by company. Stack sampling for particulate emissions from boiler plant was undertaken in 1979 to determine the ratio of coal-natural gas firing necessary to meet Regulation 308, opacity.

Existing Control Order requires an air emission inventory (stack sampling) and an assessment of fugitive air emissions.

SOLID WASTES:

Bark, clarifier sludges, bottom dredge from the log storage area and commercial wastes are disposed at a MOE certified site (A 600605); leachate is pumped to the Town of Kenora sewage treatment plant during the summer months.

ABATEMENT SYSTEMS:

Air emission controls consist of a demister on the acid tower vent, fluid bed bark burner (boiler number 4), stack extensions on dryer exhausts from numbers 9 and 10 paper machines to reduce visibility due to steam, multiclones on #1, #2 and #4 boilers, the use of natural gas with coal fired boilers to meet Regulation 308 to control SO₂ and particulate.

A bark fines removal system and clarifier handle the wet woodroom effluent; a second large clarifier handles paper mill effluent and sulphite high solids streams. The low solids content streams from #8 and #9 paper machines, sulphite blow pit washing and grinders bearings water are treated for fibre recovery by two large 120 mesh screens. The effluent is discharged through a diffuser outfall.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Boise Cascade Canada Ltd.

LOCATION: Kenora.
I.M.I.S. No: 0000870006

HAZARDOUS CONTAMINANTS:

Water: Trace contaminants in the spent sulphite liquor need evaluation.

Air: After modernization, there should be no significant pollutants.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: The flow and Total Suspended Solids are measured daily; Biochemical Oxygen Demand is measured twice per week. MOE audit samples are collected once per month. A flow proportioned sampler is not used.

Analytical methods are industry standards. A monthly report consisting of averages is submitted to the Ministry.

Air: Sulphur dioxide from the acid tower vent is measured every 8 hours. Results are not sent to MOE.

Solid wastes: Leachate is pumped to the Kenora sewage collection system and measured weekly for flow and BOD. Municipality is paid \$0.40/1000 gallons for sewage treatment of leachate.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Fine Papers Ltd.

LOCATION: Cornwall.

I.M.I.S. No: 0000140301

MILL HISTORY:

Construction/start-up date: 1888

A sulphite pulp mill was added to the groundwood facility in 1888. A soda pulp mill started in 1927 and was converted to kraft in the 1940's. The sulphite mill was shut down in 1972. Some furnish comes from New York State.

Ownership:

The mill is owned by the Canadian-owned Domtar Inc. based in Montréal, Québec and it is operated under the auspices of the Pulp and Paper Division of that firm.

Processes/Products:

Canada's largest fine paper mill converts hardwood logs and chips by the kraft pulping process and purchased pulp into commodity paper.

Number of Employees: Mill: 1,402.

ENVIRONMENTAL HISTORY: Receiving watercourse: St. Lawrence River
Basin/watershed: Upstream of Montréal

A Control Order issued in 1970 was completed in 1976. Problems persisting into 1981 are suspended solids discharges to the St. Lawrence River, odorous emissions, bacteria concentrations and the fish tainting potential of mill wastes. A Control Order was issued in 1982. At present, the majority of the Control Order requirements have been completed on time. Some remaining work on the control of bleach plant emissions must be completed by year end 1984. The time to meet the suspended solids objective will likely have to be extended to June 1987.

Research is needed on the fate of chlorinated organics in the receiving waters.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Klebsiella pneumonia are a concern because of high bacterial populations downstream from the mill. Improvements in the existing diffuser have resulted in better dispersion but the plume remains detectable for 18 kilometers. To a similar extent, phenolics violations of the water quality objective were noted but no tainting of fish or water supplies has been reported. Domtar is assessing the fish tainting potential of mill wastes. The suspended solids discharge is near compliance. Bleach plant emissions cause odour complaints.

FUTURE ACTIONS:

Company must comply with Control Order. Reduce the TSS discharge by changing the wastewaters circuit to the clarifier. Reduce Cl₂ and ClO₂ emissions by improving the bleachery. Klebsiella problem is being studied.

FINANCIAL ASSISTANCE PROGRAMS:

Domtar Inc. received \$10.5 million in provincial and \$5.25 million in federal funding towards a total capital expenditure program of \$112 million. \$42.6 million has been spent at the Cornwall mill for pulping expansion, modernization and pollution abatement.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Domtar Fine Papers at Cornwall	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				Bleached kraft yield is 45%.
<u>Pulping:</u> bleached hardwood kraft pulp	381	420	450	
purchased pulp	219	321	300	
<u>Paper/other:</u> fine papers	600	741	750	
TOTAL	600	741	750	
<u>EFFLUENT DATA:</u>				The fish toxicity test was passed once in 1977; usually the LC50 is greater than 60%. Company does its own toxicity testing when pressed by MOE. To establish the effect of mill effluent upon the river, a stream survey was made in 1982. There is no discernible dissolved oxygen problem in the St. Lawrence.
<u>Flow:</u> thousand cubic metres per day.	223	114	124	
<u>Biochemical oxygen demand:</u>	53.2	13.3	20.2	
<u>Total suspended solids:</u>	63	10.5	7.6	
<u>Fish Toxicity:</u>	Lethal since 1968.			
<u>Allowables:</u> M.O.E. TSS		6.8*	6.8*	
BOD	Not specified			
<u>Federal:</u> (1971) TSS		12.1	12.0	

* The TSS limit is based upon the 50 ppm objective which at this effluent flow is 6.8 megagrams per day. Mill is below federal TSS and BOD limits. The effluent is discharged through a submerged diffuser so there are no foam or odour problems in the river. Occasionally odours from the clarifier affect the neighborhood and cause a problem. The mill is close to passing the fish toxicity test.

AIR EMISSIONS:

The mill is located in an area of mixed land uses and the number of complaints is related to the concentration of odorous compounds. The company has agreed to keep IRS emissions to 15 and 20 ppm respectively from the recovery furnace and Copeland reactor to keep complaints to a minimum. Data from one of the two MOE continuous IRS ambient air monitors are telemetered to the mill control room; changes are made in the process to reduce impingement concentrations. These concentrations are a function of the emission rate, wind speed and wind direction. Since there are no 5 minute or 30 minute averages, it is difficult to relate the measured concentration to Regulation 308. Odours remain a problem.

Since chips are not prescreened before piling, some off-property wood dust has been noted. During high wind conditions, the chip unloading operation is shutdown; this has controlled the emissions.

There are many fugitive odour sources at this mill, namely the weak black liquor towers, weak and strong black liquor tank vents, etc. Any upsets in the incinerator-condensate odour system are serious odour problems.

Emissions from the Copeland reactor were stack measured when the reactor was started up. Additional stack testing of the recovery boiler, bleach plant and various vents have been done. The existing Control Order requires further stack testing in 1984.

SOLID WASTES:

The mill operates its own MOE approved landfill site for bark, sanitary and clarifier sludge; a large ski hill is being developed. General garbage goes to the municipal landfill site. A management plan exists for this site. In the summer, odour is given off by the ski hill; complaints have occasionally resulted.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Fine Papers Ltd.

LOCATION: Cornwall.
I.M.I.S. No: 000140301

ABATEMENT SYSTEMS:

Conventional primary effluent treatment and air emission abatement systems such as a clarifier and condensate stripper with its vapoursphere were installed. Sanitary wastes are treated by the mill's clarifier and discharged as part of the mill effluent. The Copeland reactor is used to keep the recovery boiler within good operating conditions. A dry debarking woodroom is used.

HAZARDOUS CONTAMINANTS:

Water: Occasionally PCB's have been detected in the effluent. Published research on the chlorinated compounds originating in the bleach plant has found these waste streams exhibiting genotoxic and suspected carcinogenic activity.

Air: Besides the conventional products of combustion, only nuisance low molecular weight organic sulfur compounds are released to atmosphere. All the compounds in the emissions from recovery furnace and Copeland reactor are not known.

Solid wastes: No hazardous solid wastes are generated.

MONITORING/ANALYTICAL/REPORTING REQUIREMENTS:

Water: Effluent flow is measured by a Parshall flume. While no formal calibration methods have been used, Ministry staff have spot checked the flow rate.

Timed but not flow proportional samplers are used to make a composite.

CPPA analytical methods are used in the laboratory. Periodic Total Organic Carbon and conductivity measurements have been made.

Each month, the daily flow, TSS and production rate are voluntarily reported. The BOD measurement is done more than once a week.

MOE audit samples are normally taken each month.

Air: TRS compounds, emitted by the Recovery and Copeland furnaces, are continuously measured by the two Barton titrators and are reported each month to MOE. There is no SO₂ monitoring. Data from one of the two MOE ambient air TRS analyzers is telemetered to the mill; corrective action is taken in response to these readings. Oxygen analyzers are used to maintain combustion efficiency.

Solid Wastes: The quantity of material put into the ski landfill is reported sporadically. The land adjacent to the landfill is not monitored by groundwater wells since leachate is collected in an open ditch and pumped to a sanitary sewer for treatment by Cornwall's primary treatment plant.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Packaging.

LOCATION: Red Rock.
I.M.I.S. No: 000014002

MILL HISTORY:

Construction/start-up date: 1945

This mill was built in 1945. An expansion and renovation project was undertaken in 1970 and completed in 1972.

Ownership:

The mill is owned by the Canadian-owned Domtar corporation based in Montréal, Québec and is operated under the auspices of the Pulp and Paper Division of that firm.

Processes/Products:

Linerboard is made of softwood and some hardwood chips by the kraft pulping process. Newsprint is made of softwood by the groundwood process plus 25% kraft pulp which is semi-bleached in a three-stage (CEH) bleachery process. The furnish is received as groundwood and purchased chips. Kraft pulping is in 10 batch digesters and one M & B continuous digester for soft (sawdust) pulp stock.

Number of Employees: Mill: 650; Woodlands: 310

ENVIRONMENTAL HISTORY: Receiving watercourse: Nipigon Bay,
Basin/watershed: Lake Superior.

A commercial fishery existed during the period 1940-60 in Nipigon Bay. Under a Requirement and Direction specific mill changes were made to meet taste, odour and fish toxicity objectives. Between 1975 and 1977, extensive effluent and receiving water surveys were completed to define the impact of the effluent plume in Nipigon Bay. Changes made during 1982 have resulted in the effluent almost passing the fish toxicity test without secondary treatment. A 1980 Control Order resulted in the installation of a new recovery furnace and scrubber on the lime kiln which have reduced TRS and particulate emissions. Public complaints of odour from the mill continue.

The existing Control Order addresses toxicity requirements, air emission stack sampling and inventory, a reduction of solid wastes to landfill.

PROSECUTIONS:

The company was prosecuted under Section 27, OWRC Act; found guilty and fined \$1,000 in 1970.

EXISTING CONCERNS:

In 1983, a caged fish study, a plume study and a clam exposure study was carried out to help assess the impact of the mill effluent in Nipigon Bay. The caged fish within the plume died.

FUTURE ACTIONS:

An evaluation of the 1983 study will indicate residual problems. An air emission inventory is to be submitted by the mill by year end 1983.

FINANCIAL ASSISTANCE PROGRAMS:

Domtar Inc. received \$10.5 million in provincial and \$5.25 million in federal funding towards a total capital expenditure program of \$112 million. The Red Rock mill actually expects to spend \$89.3 million for modernization, pollution abatement and process improvements of which \$53.6 million will be spent on pollution control equipment including the recovery furnace, the lime kiln scrubber and other projects. Changes do not make this a new mill as per the Federal 1981 regulation.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Domtar Fine Papers at Red Rock	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 000014002
<u>PRODUCTION DATA:</u>				Pulp yields: kraft 50%, groundwood 95%, bleached kraft 45%.
<u>Pulping:</u>				
kraft pulp	485	451	553	
groundwood pulp	140	112	140	
kraft pulp bleaching	32	30	37	
<u>Paper/other:</u>				
kraft linerboard	475	438	538	
newsprint	172	155	192	
TOTAL	647	593	730	
<u>EFFLUENT DATA:</u>				Great Lakes Section, Toxicity Unit and NWR are undertaking a receiving water survey in 1983. This water survey is extensive and includes not only dissolved oxygen but aquatic life, clams, caged fish assessment, chemical analysis of fish-water-sediment. Both the company and MOE do fish toxicity testing. No foam or odour problem is
<u>Flow:</u> thousand cubic metres per day.	103.7	91.0	92.5	
<u>Biochemical oxygen demand:</u>	15.1	15.5	17	
<u>Suspended solids:</u>	16.6	4.8	4.8	
<u>Fish Toxicity:</u>	Lethal	Lethal	Variable	
<u>Allowables:</u> M.O.E. TSS		4.8	4.8	
BOD				
<u>Federal:</u> (1971) TSS		5.0	6.3	
BOD		18.0	24.0	

encountered with with the effluent which is discharged to the surface of the Bay.

AIR EMISSIONS:

MOE's ambient TRS monitor is telemetered into the mill control room. A stack sampling inventory was completed in 1983 when additional control equipment had been installed as part of the Control Order. Although chips are received and stored in piles, fugitive wood dust does not appear to be a problem.

SOLID WASTES:

Wastes are sent to a Company owned landfill site which was approved by the Ministry (A592002). The clarifier sludge is recycled into linerboard.

ABATEMENT SYSTEMS:

The mill has installed conventional kraft mill abatement systems such as the segregation of cooling water, low solids (less than 50 ppm) and high solids (greater than 50 ppm) streams. The high solid waste stream is treated in the clarifier.

The abatement equipment consists of a clarifier on the total mill effluent, a condensate stripper, in-mill spill systems, alum treatment of woodroom effluent for toxicity reduction, a new low odour recovery boiler and electrostatic precipitator and a scrubber on the lime kiln. Odorous gases from the condensate stripper and the blow heat recovery system are incinerated.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Packaging.

LOCATION: Red Rock.
I.M.I.S. No: 000014002

HAZARDOUS CONTAMINANTS:

Water: Chlorinated organics in effluent should be evaluated as they may be a long term human health problem and are toxic to fish.

Air: Periodic odour emissions need to be addressed.

Solid wastes: No problems exist.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

CPPA industry analytical methods are used. The accuracy of the flow measurement device is known. Monthly report consists of an average for the month. Final effluent samples (three) are proportional to flow.

Water: Daily flow, pH, TSS and BOD₅ measurements are made. Toxicity test is done each month by the company. MOE audit samples are taken every two months. Toxicity samples are composited by a timer and not proportioned to flow.

Air: Emissions were measured once in 1982 and are to be inventoried in 1983. Telemetry installation to MOE IRS monitor was completed in 1983. There is no monthly report on air emissions to MOE.

Solid wastes: Mill maintains a record of truckloads sent to landfill. There are no management or closeout plans.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Fine Papers Ltd.

LOCATION: St. Catharines.
I.M.I.S. No: 0000140509

MILL HISTORY:

Construction/start-up date: 1878

The mill evolved from operations going back as far as 1878. The original pulping operation has been replaced by purchased pulp and clean wastepaper. Economic viability of the mill depends upon cheap wastepaper.

Ownership:

The mill is owned by the Canadian-owned Domtar Inc. based in Montréal, Québec and is operated under the auspices of the Pulp and Paper Division of that firm.

Processes/Products:

Pulp is converted into a fine paper product - posterboard.

Number of Employees: Mill: 350.

ENVIRONMENTAL HISTORY: Receiving watercourse: Old Welland Canal
Basin/watershed: discharges to an open section of the Old Welland Canal and thence to Twelve Mile Creek and Lake Ontario.

Past Program Approval resulted in effluent improvement. The discharge of effluent from five pulp and paper mills into the Old Welland Canal is an aesthetics problem. Alternatives should be considered to solve this regional problem.

Program Approval expired December 31, 1980.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Mill must substitute clean waste paper for purchased pulp for survival. The aesthetic problem of the Old Welland Canal is highly visible due to prime residential areas overlooking the canal. The BOD loading is still above the interim objective set in the Program Approval.

FUTURE ACTIONS:

The aesthetic problem should be addressed. Secondary effluent treatment may be required on selected waste waters to reduce BOD₅. A second clarifier may be needed to handle emergency shutdowns of the existing clarifier or scheduled clarifier maintenance.

FINANCIAL ASSISTANCE PROGRAMS:

Domtar did not include this mill in their request for an incentive. For this mill to survive, secondary furnish (used paper) instead of purchased pulp is necessary.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Domtar Fine Papers at St. Catharines.	1970 Megagrams/day	1982 Forecast	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> selective waste paper and pulp are purchased.	78.91	144	150	Saleable product contains 4.5% clay, 2.1% starch, 0.6% Rosin size, 1.2% alumina oxide respectively. Wastepaper does not have any printing but may be coloured.
<u>Paper/other:</u> fine papers	78.91	144	150	
TOTAL	78.91	144	150	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	8.65	10.1		Water quality station 6 miles away at Wellandvale Ave., St. Catharines, monitors all effluents from pulp and paper mills in Niagara area. 1982 data - TSS 207; D.O. 11.8; total coliform 8,045; fecal coliform 901.
<u>Biochemical oxygen demand:</u>	.82	.77	.70	
<u>Total suspended solids:</u>	1.63	.37	.33	
<u>Fish Toxicity:</u>	Lethal	Non- Lethal	Non- Lethal	
<u>Allowables:</u> M.O.E. TSS		0.35	0.35	Various starches have been tried to reduce BOD with minimum success. Clarifier is remote from the mill and is difficult to observe readily.
BOD		0.35	0.35	
<u>Federal:</u> (1971) TSS		1.8	1.9	
BOD		0.7	0.7	

If the clarifier breaks down, effluent is untreated. Effluent is discharged to the Old Welland Canal by open sewer. Canal is an open channel at this location.

AIR EMISSIONS:

Calculated emission rates, megagrams per year, are particulates - 6.4, oxides of nitrogen - 64 and sulphur dioxide - 15. Boilers were converted to natural gas from coal. Calculated emissions are based on fuel usage and pollutants factors for combustion. No ambient air monitoring is needed.

SOLID WASTES:

General paper mill wastes and clarifier sludge are sent to an approved landfill.

ABATEMENT SYSTEMS:

Conventional clarifier and aggressive in-mill control approach such as several different save-all screens, repiping the various water streams to recycle water at the paper machines, using different shower heads at the paper machines, etc. is used to control TSS. Effluent abatement consists of clarifier, reduced water usage and in-mill control. A switch was made to converted starch to reduce BOD.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Fine Papers Ltd.

LOCATION: St. Catharines.
I.M.I.S. No: 0000140509

HAZARDOUS CONTAMINANTS:

Water: High bacteria counts of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* are found in the Old Welland Canal. Sources are being identified by West Central Region staff in 1984.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Daily flow, pH, TSS and BOD₅ measurements are made. MOE effluent audit is once per month. Report submitted each month contains monthly average. Flow measuring device has not been calibrated or checked by independent means annually.

Air: Monitoring and reporting are not required. Emissions are insignificant combustion gases only.

Solid wastes: Sent to approved landfill, Walker's Quarry; mill maintains internal records.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Construction Materials Ltd.

LOCATION: Thorold.

I.M.I.S. No: 0000140400

MILL HISTORY:

Construction/start-up date: 1920

Product is made on a one cylinder machine. Wood flour is made from wood shavings and is blended with waste paper to make the felt. In 1983 a computer controlled honeycomb dryer system for the coated paper was installed. Clean waste paper furnish is necessary to keep mill viable.

Ownership:

The mill is owned by the Canadian-owned Domtar Inc. based in Montréal, Québec and it is operated under the auspices of the Pulp and Paper Division of that firm.

Processes/Products:

Waste corrugating medium and clean paper wastes are converted into a felt paper sheet.

Number of Employees: Mill: 55.

ENVIRONMENTAL HISTORY: Receiving watercourse: Old Welland Canal
Basin/watershed: Mill effluent connects via a buried sewer to a covered part of the Old Welland Canal and thence to Twelve Mile Creek and Lake Ontario.

Although the mill has never received a Requirement and Direction Control Order or Program Approval, the mill is working towards closure of process sewers. The discharge of effluent from five pulp and paper mills into the Old Welland Canal is an aesthetic problem. Alternatives should be considered to solve this regional problem.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The new approved felt dryer emits hydrocarbons which are visible as a blue haze when the sheet is too hot and the fan noise is excessive. Pitch from the dryer is gumming up the silencer. Silencer changes are expected to correct noise problem before year end 1984.

FUTURE ACTIONS:

Corrective action for the existing concerns. A primary clarifier may be required since mill "closure" or recycle has not been a complete success.

FINANCIAL ASSISTANCE PROGRAMS:

Mill was not part of the Domtar submission for an incentive grant.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Domtar (Construction Materials) at Thorold.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
wood flour - grinding	10	10	10	
recycle waste material				
- corrugating	37	63	64	
- paper				
-clarifier sludge				
<u>Paper/other</u>				
roofing felt	47	63	64	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	2.7	1.03		Mill reduced water usage dramatically to discharge into municipal sewer but Thorold decided to use spare capacity for a housing development. Sanitary wastes are segregated and treated by Thorold. Ambient water station 7 miles away at Wellandvale Ave., St. Catharines, monitors all effluents from pulp and paper in Niagara area. The original effluent flow was 3,420 cubic metres per day. The effluent is discharged into a buried portion of the Old Welland canal.
<u>Biochemical oxygen demand:</u>	.45	.40	.4	
<u>Total suspended solids:</u>	.36	.19	.19	
<u>Fish Toxicity:</u>	Lethal since 1970.			
<u>Allowables:</u> M.O.E. TSS		0.45	0.45	
BOD		0.45	0.45	
<u>Federal:</u> (1971) TSS		0.47	0.45	
BOD		0.40	0.40	

AIR EMISSIONS:

Emissions have never been measured. Boiler was converted to natural gas from fuel oil as a SO₂ reduction measure. Air emissions are calculated; based on fuel usage and air pollution factors for combustion. Rate of emissions, megagrams per year are particulates - 1.7, oxides of nitrogen - 19.6, and sulphur dioxide - 0.3. No ambient air monitoring is needed.

SOLID WASTES:

No saveall wastes are generated at this mill; material is recycled into product. General garbage, etc., is sent to Walker's Quarry.

ABATEMENT SYSTEMS:

Consist of a conventional save-all and in-mill control by reusing paper machine and floor washings waters.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Construction Materials Ltd.

LOCATION: Thorold.
I.M.I.S. No: 0000140400

HAZARDOUS CONTAMINANTS:

Water: Bacteria may be a concern.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Effluent is discharged through a single outfall, flow measured continuously by Parshall Flume, calculated on 24-hour average. Samples are taken in timed mode by a non-proprietary, flow dependent device. TSS is measured weekly, BOD₅ and Dissolved Solids are measured monthly. MOE effluent audit sample is taken once per month.

Air: Monitoring and reporting is needed for noise control on dryer silencer.

Solid wastes: Company keeps a record of all solid waste sent to the approved landfill, Walker Brothers Quarries.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Inc. (Packaging)

LOCATION: Trenton.

I.M.I.S. No: 0000140608

MILL HISTORY:

Construction/start-up date: 1926

Mill was built to use cereal straws. Availability of adequate power and water was a further incentive. Mill was modernized in 1956 to use forests north of Trenton.

Ownership:

The mill is owned by the Canadian-owned Domtar corporation based in Montréal, Québec and it is operated under the auspices of the Packaging Group of that firm.

Processes/Products:

Hardwood logs and chips are converted into pulp by a sodium carbonate cook and clean waste corrugating is added to make corrugating medium.

Number of Employees: Mill: 132.

ENVIRONMENTAL HISTORY: Receiving watercourse: Trent River

Basin/watershed: via Bay of Quinte to Lake Ontario.

The company complied with a Requirement and Direction to reduce the Suspended Solids and BOD₅ discharges. The pulping process, was changed from Neutral - Sulphite Semi-Chemical to Sodium Carbonate Semi-Chemical towards this end. Work was also performed to 'close' the process, it was not successful but BOD₅ discharges and water usage were reduced significantly because spent cooking liquor is recovered, stored and used as a road dust suppressant.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

When this black liquor was misapplied as a dust suppressant by township or county workers, occasional problems have been caused in well drinking water.

FUTURE ACTIONS:

Domtar is providing the installation of a black liquor evaporator. The mill is also installing a new paper machine to increase production (to approximately 280 megagrams per day).

FINANCIAL ASSISTANCE PROGRAMS:

As of December 31, 1981, \$1.07 million had been spent. \$0.45 million were slated for pollution reduction. The total Domtar capital expenditure program cost was \$112 million of which \$5.86 million was targeted for the Trenton Mill. 1.9 million has been spent. Domtar Inc. received \$10.5 million in provincial and \$5.25 million in federal funding towards their program.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Domtar Inc. at Trenton.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				Pulp yield is over 80%.
<u>Pulping:</u> neutral semi-sulphite chemical	100	Not Used.		
semi-chemical sodium carbonate pulping	-	125	137	
purchased corrugating clippings	36	32	61	
<u>Paper/other</u> corrugating medium	136	157	198	
TOTAL	136	157	198	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	2.19	1.75	1.8	Effluent flow was reduced by 87% to "close" mill. Effluent is visible in Trent River during low flow periods.
<u>Biochemical oxygen demand:</u>	9.80	3.6	5.0	There is a downstream water quality station at New Highway #2 Bridge (Station #17-0021-068-83).
<u>Total suspended solids:</u>	.64	0.33	0.46	MOE effluent analysis in 1982 found the following: phenolics 4,000 ug/l; phenol 2,940 ug/l; guaiacol 150 ug/l; vanillin 260 ug/l;
<u>Fish Toxicity:</u>	Lethal due to closure.			
<u>Allowables:</u> M.O.E. TSS		0.4		
BOD		Not specified		
<u>Federal:</u> (1971) TSS		1.2		
BOD		6.0		

syringaldehyde 230 g/l; acetovanillone 150 ug/l; acetosyringone 170 ug/l.

Company made biota surveys in 1978, 1979, 1981, 1982 and 1983; no adverse effects were found. The 1978 MOE survey found no adverse effect.

A bacterial survey conducted on the Trent River during 1984 revealed discharges from Domtar as a source of significant bacterial contamination. Further in-plant investigations are underway to identify the source(s).

AIR EMISSIONS:

Although the mill is a source of combustion gases and steam, the stack emissions have not been measured for particulate, SO₂ and NO_x. There are no continuous in-stack monitors and no ambient air monitors. Domtar monitors smoke density. Mill is within the City of Trenton.

SOLID WASTES:

Spent cooking liquor is used as dust suppressant - 28 years of experience. Solid wastes are sent to a M.O.E. approved landfill on mill property.

ABATEMENT SYSTEMS:

Consists of a conventional abatement system - clarifier and aggressive process recycle of floor washings waters, etc.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Domtar Inc. (Packaging)

LOCATION: Trenton.
I.M.I.S. No: 0000140608

HAZARDOUS CONTAMINANTS:

Water: A 1983 MOE study indicated increased phenolics concentrations in the Trent River from those found in 1981. Further investigation is needed.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Daily flow and TSS measurements are made. BOD₅ and dissolved solids are done once per week. Results are reported monthly to MOE. MOE audit sample is taken quarterly. Mill uses analytical methods as per 15th edition of Standard Methods. Parshall flume instrumentation is calibrated on a regular basis.

Air: Mill is an insignificant source of air pollution - primarily combustion gases.

Solid wastes: MOE approval for site expansion was given in 1984. There is no apparent leachate problem from the approved landfill operation.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: E. B. Eddy

LOCATION: Espanola.
I.M.I.S. No: 0000980003

MILL HISTORY:

Construction/start-up date: 1897

Started operation as a groundwood pulp mill. The mill ceased operations between 1936 and 1946. A 180 megagrams per day kraft mill was put on stream in 1946. Since the end of 1983, the modernized mill can produce in excess of 820 megagrams/day of product.

Ownership:

The mill has been operated by several different companies: Spanish River Pulp and Paper (1897), Abitibi Power and Paper (1928), 1930 shutdown (prisoner of war camp 1940-44), Kalamazoo Vegetable Parchment Co. (1943), Brown Forest Industries (1958) and E. B. Eddy (1969). Eddy is a wholly owned subsidiary of the Canadian company, George Weston Limited.

Processes/Products:

The groundwood process was shutdown in 1966. An integrated kraft process converts hardwood and softwood logs and chips into bleached pulp and specialty paper.

Number of Employees: Mill: 943.

ENVIRONMENTAL HISTORY: Receiving watercourse: Spanish River
Basin/watershed: Lake Huron.

Since 1947, air and water pollution problems with kraft pulping were documented by various Ontario government agencies. Recreational and tourist use of the surrounding area have focussed attention on the Spanish River. Requirement and Direction to reduce TSS and BOD₅ was issued in 1970. Control Order was issued, appealed by the company and subsequently withdrawn in 1972. A Control Order was issued February 28, 1978 and amended on May 29, 1980. The Eddy Ottawa mill was issued a Control Order at the same time. The river has been subjected to oxygen depletion, pH fluctuations and aesthetic impairment. Biological communities have been affected including fish tainting complaints in the Spanish Harbour. A 1980 river study identified a serious dissolved oxygen problem during low flow conditions. Fish kills have been documented in 1982 and 1983. The mill modernization, including a low odour recovery furnace, Non Condensable Gas (odour) incinerator system and a new lime kiln reduce odours but there appears to be little discernable difference in the immediate vicinity of the mill. In August 1983, the effluent secondary treatment system went on stream.

ENFORCEMENT ORDERS/PROSECUTIONS:

Charges were laid under Section 27 of the OWRC Act in 1970 and a fine of \$1,000 was imposed. The 1980 Amended Control Order requires the installation of improved water treatment and air emission control systems by December 31, 1983. The Control Order requirements were met by September 1983. A spill in July 1983 has resulted in charges being laid against the company.

EXISTING CONCERNS:

Low flow conditions in the Spanish River can be aggravated by the storage of water for power generation by INCO upstream of the mill. This may result in the oxygen content falling below 47% saturation downstream of the mill and cause the fish to suffocate. Odours from the mill persist and require further abatement. Research is needed on the fate of chlorinated organics in the receiving waters.

FUTURE ACTIONS:

Evaluation and compliance monitoring of new effluent and air abatement equipment. A better flow management is to be further improved, through consultant studies funded by the MOE, E. B. Eddy and Inco. Through better flow management, low flow conditions should be less of a problem.

FINANCIAL ASSISTANCE PROGRAMS:

The company received \$25 million towards its \$225 million capital expenditure. The province funded \$16.667 million and the federal government \$8.333 million. Two specialty paper machines and the pulping facility will be modernized; pollution abatement will cost \$17.5 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

E. B. Eddy at Espanola	1970	1982	1984	Comments
	Megagrams/day Forecast			
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> bleached and unbleached kraft pulp	446	620	830	Pulp yield is 48%.
<u>Paper/other:</u> kraft paper	77	109	120	
bleached and unbleached kraft paper	446	500	710	
parchment		11		
TOTAL	523	620	830	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	105	90.47		Sanitary wastes are separated and treated by Espanola. Water quality station is 3 miles downstream; D.O. 7.9; BOD 2.36. A dissolved oxygen study was done by the mill in 1980.
<u>Biochemical oxygen demand:</u>	20.4	19.3	3.6	
<u>Suspended solids:</u>	18.3	5.8	7.0	
<u>Fish Toxicity:</u>	Lethal	Lethal	non- lethal	
<u>Allowables:</u> M.O.E. TSS		Not specified		Another dissolved oxygen study is to be done in 1984 after the new effluent treatment system has been operating. The Control Order BOD limit is for any day since no time
BOD		3.6	3.6	
<u>Federal:</u> (1971) TSS		17.7	17.7	
BOD		23.9	32.0	

period or averaging is specified.

AIR EMISSIONS:

The mill modernization was completed in 1983 and several changes (low odour recovery boiler, NCG incineration system, new lime kiln) have resulted in reduced air emissions. The existing limited emission data will be expanded by the point source stack surveys. The Control Order requires stack sampling every two years of the recovery furnace and the two lime kilns. Weak black liquor tanks, strong black liquor tank, washer vents, decker vents and the chlorine dioxide vent were stack sampled once as per the Certificate of approval before December 31, 1984.

SOLID WASTES:

Solid wastes are sent to four company owned landfills - paper, bark and lagoon fibre sites are MOE approved, the lime mud dump is not.

ABATEMENT SYSTEMS:

Since 1974, the mill has been undergoing an internal rebuild; the mill has been kept operating while construction went on. For instance, the wood ashes were taken out of sewer; a bark fine recovery system was installed; fibre recovery was put in the pulp washing, paper machine and bleachery areas, etc. A paper mill clarifier was installed to remove pulp fibre.

This mill is the only Canadian operator of oxygen bleaching. This design reduces the raw discharge of Biochemical Oxygen Demand and effluent colour. A scrubber to eliminate odours from the tall oil process was installed in 1976. A new low odour boiler including a new electrostatic precipitator, a new lime kiln, a new condensate stripper and an incinerator of the odorous gases from the condensate stripper were put on-stream in 1983.

An aerated stabilization basin was put on stream September 1983 to treat all mill wastewaters prior to discharge to the Spanish River.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: E. B. Eddy

LOCATION: Espanola.

I.M.I.S. No: 0000980003

HAZARDOUS CONTAMINANTS:

Water: Published research has found various waste bleachery streams to exhibit genotoxic and suspected carcinogenic activity.

Air: No evident problem. Research is needed on recovery furnace emissions.

Solid wastes: No evident problem. Over 95% of the wastes are municipal type; balance can be readily treated to be innocuous.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Effluent flow is measured daily by a calibrated (lithium tracer) flume. Daily samples are analyzed for TSS, TOC and sodium. Samples are composited by automatic samples. The final pH of the effluent is measured continuously. When the river is at low flow, mill staff do a dissolved oxygen run once per week. Monthly results from 7 groundwater wells around the aeration basin are reported. Effluent audit samples are taken by MOE every second month. Effluent data is reported each month to MOE.

Air: Ambient air monitored by company (6 dustfall collectors) and MOE (dustfall and hi-volume sampler). In 1983, mill is to operate four hi-volume samplers and to provide shelter for its own TRS monitor which results will be telemetered to the mill and MOE Sudbury. There are no in-stack monitors.

Solid wastes: There is no report as to the number of truck loads or type of wastes.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: E. B. Eddy Forest Products Limited

LOCATION: Ottawa.

I.M.I.S. No: 0000980201

MILL HISTORY:

Construction/start-up date: 1905

The mill has had problems with its competitive position despite upgrading of the small and outmoded paper machines. The paperboard mill was closed in September 1979, due to lack of viability. To a great extent, this mill is integrated with Eddy's paper mill in Hull.

Ownership:

The George Weston Company acquired the Ottawa and Hull Mills through a takeover of E. B. Eddy in 1962.

Processes/Products:

Pulp is made into special fine papers of several grades.

Number of Employees: Mill: 445.

ENVIRONMENTAL HISTORY: Receiving watercourse: Ottawa River
Basin/watershed: St. Lawrence River

The discharge of coloured, material and suspended solids has contributed to the aesthetic impairment of the Ottawa River. The discharge of sanitary sewage has also been the subject of a Control Order issued May 23, 1978 and amended July 27, 1978, to allow a delay in the requirement to cease discharge of sanitary wastes (to December, 1980). All provisions of the Control Order were completed by June 1982.

A Control Order issued in 1978 required the elimination of the sanitary wastes by December 1980, control of suspended solids from the Specialty Mill by June 1982 and control of suspended solids from the Board Mill by December 1983. The first two requirements were complied with; the Board Mill was closed.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Although the pollution load of this effluent is small, the effluent remains noticeable in this highly visible stretch of river.

FUTURE ACTIONS:

The National Capital Commission has proposed in the past to buy the property and convert it into a park.

FINANCIAL ASSISTANCE PROGRAMS:

The \$156 million capital expenditure program included \$9.24 million for Ottawa to be spent between 1979 and 1983. \$11.5 million was spent on the modernization of paper, stock and finishing production facilities. \$420,000 was the pollution abatement cost.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

E. B. Eddy at Ottawa	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> purchased pulp	195	158	150	
<u>Paper/other:</u> fine papers paperboards	127 68	158 -	150 -	
TOTAL	195	158	150	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	16.8	9.93	8.0	Effluent flow was reduced from original 19,000 cubic metre per day. There is no downstream water quality station.
<u>Biochemical oxygen demand:</u>	2.3	1.59	1.6	
<u>Total suspended solids:</u>	5.3	1.52	0.5	
<u>Fish Toxicity:</u>		* Lethal		
<u>Allowables:</u> M.O.E. TSS		0.7	0.7	
		BOD	Not specified	
<u>Federal:</u> (1971) TSS		2.0	1.9	
		BOD	1.1	1.1

* Although the mill failed the 1981 fish toxicity test, the mill is normally non-toxic. Some 12 years ago, a river survey for dissolved oxygen was made; mill is considered to be an insignificant source. The effluent is discharged through a diffuser and does not cause odour and foam problems.

AIR EMISSIONS:

Due to the nature of the mill, papermaking, steam and combustion gases are the only air pollutants emitted. No air emission inventory and no ambient air monitors have been used. The mill is situated in the City of Ottawa on Chadiere Island, within sight of Parliament Buildings. There are conflicting uses of this area such as recreational boating and tourism.

SOLID WASTES:

Garbage is sent to the Ottawa municipal dump. Clarifier sludge is sent to the several mills for recycle.

ABATEMENT SYSTEMS:

Conventional effluent treatment (fibre recovery, whitewater recycle systems, automated savealls, primary clarifier, diffuser) equipment was installed after several paper machine modifications were made to recycle white waters, etc.

Sanitary wastes are segregated and treated by E. B. Eddy.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: E. B. Eddy Forest Products Limited

LOCATION: Ottawa.
I.M.I.S. No: 0000980201

HAZARDOUS CONTAMINANTS:

Water: None are evident.

Air: None are evident.

Solid wastes: None are evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: The flow is measured by two Parshall flumes, one at the input to the clarifier and the other, at the output. The Parshall flumes are calibrated regularly (whenever the clarifier is cleaned) by measuring the time to refill the clarifier. Accuracy is $\pm 5\%$.

For each operating day, a sample is composited by a continuous timed sampler (not proportional). A Total Suspended Solids and Biochemical Oxygen Demand is done on the sample using C.P.P.A. analytical methods. Each month the monthly average of Total Suspended Solids, Biochemical Oxygen Demand, flow and production is reported.

Air: No monitoring is required and thus there is no routine air report.

Solid wastes: Sludge from the clarifier is sent to various mills for recycling. No report is required.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Fraser Inc. at Thorold.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				Saleable product contains 10% and 6.6% of clay and starch respectively.
Wastepaper caustic deinked				
Purchased pulp				
<u>Paper/other:</u> printing and writing paper	216	218	330	
TOTAL	216	218	330	
<u>EFFLUENT DATA:</u>				Water quality station at Wellandvale Ave., St. Catharines, monitors all effluents from pulp and paper mills in Niagara area. 1982 data - TSS 207; D.O. 11.8; total coliform 8,045; fecal coliform 901. The mill is attempting to recycle more water from the clarifier discharge; up to 20% has been recycled. A sand
<u>Flow:</u> thousand cubic metres per day.	26.8	22.88	22.0	
<u>Biochemical oxygen demand:</u>	13.3	2.3	2.3	
<u>Total suspended solids:</u>	24.6	.95	1.5	
<u>Fish Toxicity:</u>	Lethal	Non-Lethal	Non-Lethal	
<u>Allowables:</u> M.O.E. TSS		1.5	1.5	
BOD		Not stated.		
<u>Federal:</u> (1971) TSS		2.8	4.2	
BOD		2.3	2.3	

filter is used on raw water taken into the mill; some clarifier effluent is passed through this sand filter and thus reused.

AIR EMISSIONS:

Land use is mixed; the mill is situated in the City of Thorold. Air emissions are calculated: based on fuel usage and pollutant factors for combustion. Combustion emissions at kilograms per day are particulates - 27.7, sulphur dioxide - 255 and oxides of nitrogen 110. No ambient air monitors are required.
The new mill has not been surveyed for known and suspected odour sources.

SOLID WASTES:

Generation rate in megagrams per year is clarifier sludge - 19,707 and general mill waste - 900. Wastes are sent to Walker's Quarry and are recorded by waybill.

ABATEMENT SYSTEMS:

A clarifier was installed in 1968 and subsequently fibre recycle and reuse systems have been installed at the paper machines. An innovative effluent treatment system was installed for secondary treatment of deinking wastewaters; this activated sludge system treats deinking effluent. The boiler was converted to natural gas from oil to reduce SO₂ emissions. The clarifier treats the total mill effluent. Sanitary wastes are separated and treated by the mill.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Fraser Inc.

LOCATION: Thorold.
I.M.I.S. No: 0000940007

MILL HISTORY:

Construction/start-up date: 1903

Part of the mill dates to 1902. The latest addition to the mill, a paper machine was completed in 1961. The mill was owned by Abitibi-Price until 1981. The deinking process was started in 1946 and is the only mill to deink ledger paper.

Ownership:

Fraser Inc. is controlled by Noranda, 64% stock ownership, a public Canadian corporation, headquartered in Toronto. Noranda owns 49% of MacMillan Bloedel.

Processes/Products:

Fine printing and writing papers are made from pulp and deinked fine papers. This is the only used fine paper deinking mill in Canada which occasionally imports ledger paper from as far as Florida, U.S.A.

Number of Employees: Mill: 660.

ENVIRONMENTAL HISTORY: Receiving watercourse: Old Welland Canal
Basin/watershed: The Old Welland Canal thence to Twelve Mile Creek and Lake Ontario.

A Control Order was issued on November 10, 1977. Reductions of suspended solids and BOD₅ were required. Compliance was achieved through the construction and implementation of a modern conventional activated sludge system with neutralization, clarification, aeration and secondary settling. The original large clarifier was integrated into the design. The treatment system was designed as a stacked package to minimize the use of land.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

The mill is located in downtown Thorold. The control of odour and foam from the activated sludge plant is critical to prevent complaints. Water sprays were installed to control airborne foam from the activated sludge plant. Clarifier may have to be by-passed due to a high clarifier torque or a failure of the mill pumping system.

FUTURE ACTIONS:

The aesthetic problem of the Old Welland Canal is highly visible due to prime residential areas overlooking the canal. The mill is attempting to recycle more clarified effluent; at present 3.5% of the raw water includes clarified effluent. A second clarifier may be required to ensure TSS control during scheduled clarifier maintenance and emergencies.

FINANCIAL ASSISTANCE PROGRAMS:

There was a very small amount for this mill under the Abitibi-Price 1979 grant plan.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Fraser Inc.

LOCATION: Thorold.
I.M.I.S. No: 0000940007

HAZARDOUS CONTAMINANTS:

Water: Effluent needs to be investigated for trace organics.

High bacteria counts of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* are found in the Old Welland Canal. Sources are being identified by West Central Region staff in the 1984 survey.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Flow is continuously recorded by a magnetic flow meter on a single outfall and reconciled with measurements of individual sewers. Timed sampler provides a shift sample which is blended for a daily sample. Biochemical Oxygen Demand is analysed 4 to 5 times per week; Total Suspended Solids and Total Dissolved Solids, daily. MOE effluent audit is once per month.

Air: A report is not required. Emissions are combustion gases and steam only. To date, the chlorine gas emissions from the bleach plant have not been found to be significant.

Solid wastes: Wastes are sent to approved landfill and are recorded internally.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Great Lakes Forest Products at Dryden.	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000840108
<u>PRODUCTION DATA:</u>				Bleached Pulp yield is 46% of wood.
<u>Pulping:</u> kraft (bleached and unbleached)				
<u>Paper/other:</u>				
kraft pulp	354	374		
kraft specialty papers	169	199		
TOTAL	523	573	725	
<u>EFFLUENT DATA:</u>				Nearest water quality station in Wabigoon River is about 500 feet downstream of diffuser; 1982 data as follows: Dissolved Oxygen 8.0, BOD, 6.8, TSS 12.4 (all mg./l. annual arithmetic mean); total coliform 38,978, fecal coliform 226 (annual geometric mean).
<u>Flow:</u> thousand cubic metres per day.	139	113.9	123	
<u>Biochemical oxygen demand:</u>	21.9	14.2	4.5	
<u>Suspended solids:</u>	17.8	5.3	5.6	
<u>Fish Toxicity:</u>	Lethal	Lethal	Non-lethal	
<u>Allowables:</u> M.O.E. TSS		9.9	5.6	
BOD				
<u>Federal:</u> (1971) TSS		10.9	13.8	
BOD		26.4	33.4	

AIR EMISSIONS:

Mill is a controlled source of particulates, oxides of nitrogen, odours (total reduced sulphur compounds) and sulphur dioxide. Odorous gases are continuously monitored at one site. Routine stack sampling for particulate and TRS monitor on recovery stack. The new mill has not been surveyed for known and suspected odour sources.

SOLID WASTES:

Bark, domestic waste, commercial waste, and clarifier sludges are disposed at a MOE certified site (A 600104). Lime wastes are disposed at MOE certified site (A 900078). Mercury wastes are disposed at certified site (A 7145502), now closed. Some bark wastes are burned for steam generation.

ABATEMENT SYSTEMS:

Great Lakes uses continuous processes as compared to batch; this results in less spills. Scrubbers are used on the lime kiln stack, the bleach plant vent, and the tall oil reactor vent; an electrostatic precipitator, on the recovery boiler. Thermal oxidation of Non Condemnable Gases from the continuous-digester-turpentine system, from the evaporator system, and from the condensate stripper, controls odour emissions. Weak and strong black liquor oxidation systems reduce odours.

The following systems are used to control effluent quality:

- spill controls, clarifier on total effluent with spill pond and aeration-stabilization basins (after August, 1983),
- dry debarking,
- continuous Kamyr digester; diffusion washing; 5-stage bleach plant and a pulp dryer. The clarifier treats total mill effluent.

STATUS REPORT
ONTARIO PULP AND PAPER INDUSTRY

NAME: Great Lakes Forest Products Ltd.

LOCATION: Dryden.

I.M.I.S. No: 0000840108

MILL HISTORY:

Construction/start-up date: 1913

Company (originally Dryden Timber and Power Company) was formed in 1910. Production (kraft pulp and sheathing) began in 1913. Company became Dryden Paper Co. Ltd., which in 1953 was sold to Anglo-Canadian Paper Mills Ltd. and underwent a major expansion in 1956-58. Anglo-Canadian Pulp was acquired in 1960 by the Reed Paper Group of London, England. Further modernization of Dryden Paper was carried out during the 1960's. In 1975, Dryden Paper Co. became Reed Ltd., Dryden Operations. It was purchased in December, 1979, by Great Lakes Forest Products, Ltd. who instituted a major modernization and expansion program which included several large pollution abatement measures. This mill was committed to a future in fine papers when a new paper machine was installed in 1982-83.

Ownership:

Owned since 1953 by Anglo-Canadian Pulp and Paper Mills Ltd. which in 1960 became a subsidiary of Reed Paper Group, later Reed Ltd., the mill was purchased by Great Lakes in 1979. The mill is currently owned by Great Lakes Forest Products Ltd. which is controlled by Canadian Pacific Enterprises Ltd. The Head Office is in Thunder Bay.

Processes/Products:

An integrated mill making fine papers and market bleached kraft pulp from softwood logs and chips by using kraft pulping. Products also include stud lumber.

Number of Employees: Mill: 1,033; Woodlot: 460.

ENVIRONMENTAL HISTORY: Receiving watercourse: Wabigoon River.

Basin/watershed: English River/Arctic

The mill has been the centre of environmental controversy over the discharge of mercury from the associated chlor-alkali plant of Dryden Chemicals. This plant successfully met the MOE requirements following a "clean up and treat" Directive, and subsequently, on the initiative of Reed Ltd., in 1975 replaced the mercury-cell chlor-alkali process with new non-mercury technology using permionic membrane cells - the first installation of its kind in North America - at a cost of \$5.5 million. The gross pollution of the Wabigoon River has affected 27 miles of river and the downstream use of the river for commercial and sport fisheries.

A Requirement and Direction and an air emission abatement program were issued in 1974. Under the later, the old undersized electrostatic precipitator was replaced with a new high-efficiency unit in 1977. A lime kiln scrubber was constructed in 1977. A new multiple-effect black liquor evaporator, replacing two obsolete and overloaded units, was started up in 1979. The last major item in the Control Order - secondary effluent treatment - started up in August 1983.

PROSECUTIONS:

Reed was charged under the Environmental Protection Act in November, 1976, with pollution of the Wabigoon. The company was found guilty and fined \$5,000.

EXISTING CONCERNS:

Biological treatment of the bleached kraft wastes should reduce the possibility of mutagenicity. Sludge and biota mercury levels in the Wabigoon are still elevated but discharges are minimal. Water quality may be further affected by decomposing sludge banks which were deposited in the Wabigoon before the clarifier was installed. Mercury pollution in the river system is undergoing continuous study by a Federal-Provincial Committee. Potential blowing foam and odour problems from secondary lagoons will require evaluation and control. Research is needed on the fate of chlorinated organics in the receiving waters.

FUTURE ACTIONS:

State of the art technology in the new mill requires evaluation of air and effluent discharges.

FINANCIAL ASSISTANCE PROGRAMS:

On March 31, 1980, the company was given a grant of \$48 million for modernization, energy conservation and pollution control for the Dryden and Thunder Bay Mills. The total expenditure was \$309.7 million and in 1981, a further grant of \$10 million for a \$128 million expenditure (a new fine paper machine) at Dryden. The Dryden expenditure was \$355.4 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Great Lakes Forest Products Ltd.

LOCATION: Dryden.
I.M.I.S. No: 0000840108

HAZARDOUS CONTAMINANTS:

Water: Published research has found various bleachery streams to exhibit genotoxic and suspected carcinogenic activity.

Air: No problem is evident. Research of recovery furnace emissions is needed.

Solid wastes: Are not a problem.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Daily measurements are made for flow, pH, Biochemical Oxygen Demand, Total Suspended Solids, ammonia (Kjeldahl); phosphorus, once every two weeks; 96 hour LC50 fish lethality test, twice per year; audited once every two months by MOE.

Air: Continuous monitoring of the oxygen and Total Reduced Sulphur compounds (odours) from the recovery boiler with occasional stack sampling on a grab basis for particulate and IRS from other sources provides air emission data. Results are not automatically reported to MOE.

Solid wastes: Drainage from the bark disposal site is monitored bi-weekly during summer months for Biochemical Oxygen Demand, sodium, alkalinity, and Total Dissolved Solids; audited once every two months by MOE.

STATUS REPORT
ONTARIO PULP AND PAPER INDUSTRY

NAME: Great Lakes Forest Products Limited

LOCATION: Thunder Bay.
I.M.I.S. No: 0000840009

MILL HISTORY:

Construction/start-up date: 1923

The following dates outline the significant changes at this mill:

- 1924 - groundwood pulp mill started up.
- 1926 - sulphite mill added.
- 1928 and 1929 - Nos. 1 and 2 newsprint machines started up.
- 1957 and 1958 - Nos. 3 and 4 newsprint machines started up.
- 1966 - "A" bleached kraft pulp mill started up.
- 1973 - stud lumber mill started up.
- 1975 - stud lumber mill expanded, and waferboard mill started up.
- 1976 - "B" bleached kraft pulp mill started up using "closed cycle concept".

Ownership:

This mill complex, the largest in Ontario, is owned and operated by Great Lakes Forest Products Ltd., incorporated in 1936 in Ontario. 98.0% of the shares are held in Canada, the majority shareholder being Canadian Pacific Enterprises Limited, Montréal.

Processes/Products:

An integrated mill which produces newsprint, bleached kraft market pulp (softwood and hardwood), stud lumber and waferboard. The mill processes include: stone groundwood pulping and brightening, high-yield bisulphite pulping (@ pH 4.5), kraft pulping and bleaching.

Number of Employees: Mill: 2,757; Woodlands: 1,151.

ENVIRONMENTAL HISTORY: Receiving watercourse: Kaministiquia River
Basin/watershed: Lake Superior

The mill complex has been the scene of several major innovations. Black liquor oxidation was introduced to reduce kraft odours in 1966. A later decision to attempt closed cycle processing for the "B" kraft mill to avoid the Ministry requirement for aerated lagoons received overwhelming public approval. The Ministry has accepted the process provided that similar technology is applied to the "A" mill. The Reeve-Rapson process requires modification to be successfully implemented. The only sulphite mill in North America where spent liquor is sent to a kraft recovery furnace. Other innovations pertaining to the environmental controls include:

- 1971 - first application of a Copeland fluidized-bed reactor to incinerating solid wastes (which it achieves without producing significant air pollution).
- 1972 - first North American installation of a Swedish-developed fully-mechanized wood-handling and wood-processing system, including dry debarking.
- 1983 - first North American installation of a new type of pulp washer (a pressure diffuser), in "A" kraft mill.

The company has complied with past Program Approvals, Requirement and Direction and Control Order.

PROSECUTIONS:

In August, 1983, the company was charged under section 16(1) of the O.W.R.A. with allowing the discharge of a contaminant to the Kaministiquia River. In April, 1984, they were found guilty and fined \$3,500.

EXISTING CONCERNS:

Low level emissions of Total Reduce Sulphur compounds (odours), with periodic fumigations are of concern. The dissolved oxygen problem in the Kaministiquia River requires further study and evaluation. Research is needed on the fate of chlorinated organics in the receiving waters.

FUTURE ACTIONS: Present Control Order requirements must be met by 1985.

FINANCIAL ASSISTANCE PROGRAMS:

On March 31, 1980, the company was given a grant of \$38 million for both Dryden and Thunder Bay for a final expenditure of \$309 million. \$82.3 million will be spent on the Thunder Bay Mill out of a total investment of \$437.7 million of which the governments of Ontario and Canada contributed \$48 million. The total expenditure at Dryden and Thunder Bay is \$437.7 million with a total grant of \$48 million.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Great Lakes Forest Products at Thunder Bay.	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000840009
<u>PRODUCTION DATA:</u>				Pulp yield is as follows: 95% groundwood 75% sulphite 45% kraft
<u>Pulping:</u>				
groundwood		800	800	
sulphite		219	219	
kraft		1,000	1,381	
<u>Paper/other:</u>				
newsprint	1,079	1,100		
unbleached sulphite pulp	79			
bleached and semi-bleached kraft pulp	427	1,019		
TOTAL	1,585	2,019	2,400	
<u>EFFLUENT DATA:</u>				The Kaministiquia River mouth is sampled on a regular basis by MOE and forms part of the Ministry's water quality network.
<u>Flow:</u> thousand cubic metres per day.	233	248	250	1982 data are: TSS 134.2; D.O. 9.5; BOD 1.1 (annual arithmetic mean). Bacteria (annual geometric mean) - total coliform 3,699; fecal coliform 124.
<u>Biochemical oxygen demand:</u>	107.8	81.9	55.0	
<u>Suspended solids:</u>	69.7	12.3	14.0	
<u>Fish Toxicity:</u>	Lethal	Lethal	Lethal	
<u>Allowables:</u> M.O.E.				
TSS	14.0	14.0	14.0	
BOD	55.0	55.0	55.0	
<u>Federal:</u> (1971)				
TSS	31.0	31.0	31.0	
BOD	68.4	68.4	68.4	

AIR EMISSIONS:

MOE has three ambient air monitors to detect Total Reduced Sulphur compounds (odours), sulphur dioxide and particulate. The company operates a TRS monitor in "A" kraft mill recovery stack and "B" kraft mill lime kiln. The company is reporting TRS data from specified sources. The company conducted an air emission inventory in 1980.

SOLID WASTES:

Since 1972, mill refuse and sludge has been incinerated in the Copeland incinerator. Two power boilers were installed in 1966 and 1976; one burns bark, wood residues and primary sludge. Dirty woodwaste is disposed of at a MOE approved site (A59011).

ABATEMENT SYSTEMS:

Conventional air and water abatement equipment are combined with innovative process changes for environmental benefit such as primary effluent treatment for kraft mill "A" (1967), primary treatment for newsprint operation (1971) Rapson-Reeve (modified) closed-cycle process developed (1976-78), with salt recovery, dry barking woodroom, counter current bleach plant washing and high yield sulphite pulping (implemented 1972-1974). The spill control system is integral to the closed-cycle design. Scrubber on the tall oil reactor, the black liquor oxidation system, the particulate collector on recovery furnace, the scrubber on lime kiln and odorous gases incineration control air emissions. In 1983, the spent bisulphite liquor cross-recovery system and a pressure diffuser for "A" mill were installed. When the switch was made to burning coal, fabric dust collectors were installed on No. 1 and No. 2 steam generating power boilers.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Great Lakes Forest Products Ltd.

LOCATION: Thunder Bay.
I.M.I.S. No: 0000840009

HAZARDOUS CONTAMINANTS:

Water: The toxicity question must be addressed. "Closed" process cycle when functioning eliminates chlorinated organic compounds. Published research has found various waste bleachery streams to exhibit genotoxic and suspected carcinogenic activity.

Air: Emissions must be evaluated.

Solid wastes: Are not considered to be a problem.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Biochemical Oxygen Demand and Suspended Solids are monitored daily but averaging over 30-day period. Daily data is available to MOE. MOE audit samples are taken every second month.

Air: Air emissions were measured once by stack sampling in 1980. Total Reduced Sulphur compounds (odours) from the recovery "A" furnace and "B" lime kiln are monitored continuously but not reported routinely.

Solid wastes: Bark is sent to an approved company-owned landfill site.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: James River Marathon Limited
(formerly American Can of Canada Ltd.)

LOCATION: Marathon.
I.M.I.S. No: 0000850008

MILL HISTORY:

Construction/start-up date: 1945

The mill was constructed in 1945 as Marathon Paper Mills of Canada. Bought by American Can Company. Sold to a James River Subsidiary on April 22, 1983.

Ownership:

James River-Marathon Ltd. is owned 80% by James River Corp. and 20% by Buchanan Forest Products. American Can has increased their ownership of James River to 18.7%. The Crown licence for the Pic cutting area is in James River Marathon Limited's name. A subsidiary of Buchanan Forest Products, Pic River Forest Products, is cutting on the Pic limits under a third party agreement.

Processes/Products:

Both hardwood and softwood logs and chips are converted into bleached pulp through the kraft process.

Number of Employees: Mill: 500.

ENVIRONMENTAL HISTORY: Receiving watercourse: Peninsula Harbour.
Basin/watershed: Lake Superior

An Air Program Approval was issued in March 1973, which covered six air emission sources. Two were controlled on schedule. A Control Order issued in 1977 included Suspended Solids reduction (inplant) and recommendations for toxicity reduction by December 31, 1978. A Control Order was served on American Can of Canada on December 11, 1980. On April 25, 1984, a new Control Order was served on James River Marathon Limited.

PROSECUTIONS:

The existing chlor-alkali plant was discharging mercury into the water at a rate that on occasion exceeded Environment Canada's allowable rate. The company was successfully prosecuted by the Ministry over these excesses and fined \$64,000. This chlor-alkali plant was shutdown in 1977. In June 1982, the company was successfully prosecuted for allowing the discharge of a contaminant into the environment and fined \$2,000.

EXISTING CONCERNS:

American Can for financial reasons had discontinued both the environmental and productivity improvement programs prior to sale. The effluent will be toxic despite excessive water use until the mill is renovated by the new owners. The company has, in the past, failed to achieve BOD and S.S. loading requirements. Emissions of suspended particulate matter do, at times, exceed Ministry regulations. Foam problems from effluent discharge will require evaluation and control. Research is needed on the fate of chlorinated organics in the receiving waters.

FUTURE ACTIONS:

The new owners propose to:

- evaluate the potential for bark burning
- install an effluent diffuser
- close the existing mercury disposal site
- continue the mill modernization program which includes:
 - the installation of new chlorine dioxide and extraction stage washers
 - a rebuild of the existing chlorine dioxide generator
 - the installation of an eighth digester
 - the modernization of the recausticizing area
 - the replacement of the blow heat recovery system

New company proposes to eliminate the wood yard operation.

FINANCIAL ASSISTANCE PROGRAMS:

The new owner of this mill, James River-Marathon received a \$8.3 million grant towards a planned expenditure of \$95 million. The projected completion date is 1988.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

James River (American Can) at Marathon.	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000850008
<u>PRODUCTION DATA:</u>				Pulp yield is 46%.
<u>Pulping:</u> bleached kraft pulping	443	393	450	
<u>Paper/other:</u> bleached kraft pulp	443	393	450	
TOTAL	443	393	450	
<u>EFFLUENT DATA:</u>				There is no water quality monitoring station in close proximity to the mill. The latest survey was conducted by M.O.E. in 1975.
<u>Flow:</u> thousand cubic metres per day.	83.9	81.7		
<u>Biochemical oxygen demand:</u>	14.5	17.1		
<u>Suspended solids:</u>	9.6	9.7		
<u>Fish Toxicity:</u>	Lethal	Lethal	Lethal	
<u>Allowables:</u> M.O.E. TSS	4.0	4.0	4.0	
BOD	10.5	10.5	10.5	
<u>Federal:</u> (1971) TSS		14.0		
BOD		6.3		

AIR EMISSIONS:

A potentially major source of odour and particulate, the recovery furnace, is under good control. Other pollution sources to be controlled as per the Control Order. An air emission survey was completed in 1980. The new Control Order requires the company to complete an air emission inventory by August 31, 1989.

SOLID WASTES:

Mercury contaminated wastes have been deposited at a certified landfill site (A591802). A second site (A739801) is used for the disposal of other non-hazardous waste materials.

ABATEMENT SYSTEMS:

A clarifier was installed on selected waste water streams. The lime mud dregs are removed from the sewer by a new filter. Scrubbers were installed on the lime kiln and the tall oil reactor. The wet debarking/slasher operation was converted to a closed-cycle system. A new low odour recovery boiler with a generously sized electrostatic precipitator was built. Coal is used as a fuel and there is at times an opacity problem. A foam retention lagoon and diffuser was installed in 1984.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: James River Marathon
(formerly American Can of Canada Ltd.)

LOCATION: Marathon.
I.M.I.S. No: 0000850008

HAZARDOUS CONTAMINANTS:

Water: The effluent is lethal to fish. Published research has found various bleachery waste streams to exhibit genotoxic and carcinogenic activity.

Air: No problem is evident; research of emissions from recovery furnace is needed.

Solid wastes: No problems are foreseen.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Water flow, pH and Total Suspended Solids are done daily. A Biochemical Oxygen Demand measurement is done three times a week.

Air: No emissions are monitored or reported.

Solid wastes: The amount of material being deposited at the landfill sites is to be reported.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada

LOCATION: Huntsville.
I.M.I.S. No: 0000830109

MILL HISTORY:

Construction/start-up date: 1971

This is a model mill for papermaking operation.

Ownership:

The mill is owned by Kimberly-Clark U.S.A., headquartered in Wisconsin.

Processes/Products:

Pulp is converted into tissue. The largest tissue mill in Canada.

Number of Employees: Mill: Stable at 70.

ENVIRONMENTAL HISTORY: Receiving watercourse: East River.

Basin/watershed: The mill effluent does not have any significant effect on the river.

The siting of the mill in the Muskoka's vacation heartland was the subject of so much public interest and occasional controversy that the waste treatment facilities were designed using 'Best Available Technology'. The company cooperated with all Ministry requirements and scrupulous pre- and post-operational surveys were carried out. Up to 90% of process water is treated and re-used and spray irrigation of discharged water eliminates waste input to the river for 6 months of the year. An intensive public relations operation, recruitment of local people and lack of environmental impact made for relatively trouble-free implementation.

ENFORCEMENT ORDERS/PROSECUTIONS:

None.

EXISTING CONCERNS:

None.

FUTURE ACTIONS:

An expansion has been announced and a new effluent treatment system may be proposed. Alternatives to the existing secondary treatment system are considered. The secondary treatment equipment - percolating beds - are constantly plugged.

FINANCIAL ASSISTANCE PROGRAMS:

Not needed and a request for a grant was not made.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Kimberly-Clark at Huntsville.	1970	1982	1984	Comments
	Megagrams/day Forecast			
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> Purchased pulp	85	104.3	85	
<u>Paper/other:</u> Tissue	85	104.3	85	
TOTAL	85	104.3	85	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.		.30		
<u>Biochemical oxygen demand:</u>		.02		
<u>Suspended solids:</u>		.00		
<u>Toxicity:</u>				
<u>Allowables:</u> M.O.E.				
Not applicable				
<u>Federal:</u> Not applicable				

AIR EMISSIONS:

Air emissions were NEVER MEASURED. Located in prime vacationland, the plant is subjected to close scrutiny. Steam from paper dryer and combustion gases from gas-fired boilers (oil standby) are emitted to air.

SOLID WASTES:

Sent to an approved landfill.

ABATEMENT SYSTEMS:

Whitewater is recycled through a disk save all, then to a large clarifier with 80% recycle. A sealed polishing basin with aerated overflow is next. Groundwater is recharged through irrigation of percolating beds or winter discharge through a foam trap and submerged diffusers. Septic tank is used for sanitary wastes.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada

LOCATION: Huntsville.
I.M.I.S. No: 0000830109

HAZARDOUS CONTAMINANTS:

Water: None.

Air: None.

Solid wastes: None.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Effluent is monitored to ensure efficiency of effluent treatment. There is no regular report to MOE.

Air: No report is required: insignificant emissions of combustion gases and steam.

Solid wastes: Waybills are used when sludge is sent to an approved landfill operation in Huntsville.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada Ltd.

LOCATION: St. Catharines.

I.M.I.S. No: 0000830208

MILL HISTORY:

Construction/start-up date: 1912

Originally started as a groundwood mill due to cheap electricity. Currently there is no pulping and the three paper machines operate on dry purchased furnish. Economic viability of mill depends upon using clean waste paper.

Ownership:

The mill is owned by Kimberly-Clark U.S.A., headquartered in Wisconsin.

Processes/Products:

Pulp and clean used paper is converted into tissue and crepe wadding.

Number of Employees: Mill: 244.

ENVIRONMENTAL HISTORY: Receiving watercourse: Old Welland Canal.

Basin/watershed: discharges into an open section of the Old Welland Canal and thence to Twelve Mile Creek and Lake Ontario.

The mill has a recent history of co-operation with Ministry personnel and essentially complies with all Ministry and federal requirements. A Program Approval for the reduction of BOD₅ loading was successfully concluded in 1981. A paper machine was extensively rebuilt with local initiative and engineering skills in the late 1970's to dramatically reduce water usage on the mill, a unique achievement for Canada.

PROSECUTIONS:

Charges were laid in 1968 on water pollution; dismissed by the court but a commitment was made to reduce Total Suspended Solids.

EXISTING CONCERNS:

Mill must substitute clean waste paper for purchased pulp for survival. The aesthetic problem of the Old Welland Canal is highly visible due to prime residential areas overlooking the canal. The BOD loading is still above the interim objective set in the Program Approval due to the additional use of secondary pulp or clean wastepaper.

FUTURE ACTIONS:

The company is investigating methods to reduce the BOD load in the effluent through Kimberly-Clark's engineering group in the U.S.A. The aesthetic problem should be addressed. In 1984, the mill began to use the effluent polishing ponds again. This appears to be successful in lowering the loadings of TSS and BOD.

FINANCIAL ASSISTANCE PROGRAMS:

Financial assistance was not needed and the company did not apply for a grant. Secondary furnish clean wastepaper is necessary for this mill to survive.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada Ltd.

LOCATION: St. Catharines.
I.M.I.S. No: 0000830208

HAZARDOUS CONTAMINANTS:

Water: High bacteria counts of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* are found in the Old Welland Canal. Sources are being identified by West Central Region staff in the 1984 survey.

Air: There is no evident problem.

Solid wastes: There is no evident problem.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Effluent is discharged through a single outfall; flow is continuously monitored on magnetic flowmeter and reconciled with measurements on in-plant sewers. Daily automatically composited samples are analyzed for BOD₅ weekly, suspended solids and dissolved solids daily. MOE effluent audit sample is taken once per month. Monthly report is submitted which consists of averages. Flow measurement device is not routinely calibrated or checked by independent means on an annual basis.

Air: A report is not required: insignificant emissions of combustion gases and steam.

Solid wastes: Mill keeps a record of clarifier sludge, general garbage and maintenance refuse sent to the approved landfill site at Walker Brothers' Quarry.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Kimberly-Clark at St. Catharines.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> Purchased pulp	96	84.7	82	
<u>Paper/other:</u> Tissue and crepe wadding	96	84.7	82	
TOTAL	96	84.7	82	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	12.3	10.04	9.3	Voluntary reduction of BOD ₅ to TSS numerical value. Federal requirement for TSS is 10 kilograms Mg of product. There is an aesthetic problem. Prime residential areas overlook the canal and there are plans for park and recreation development along the Old Welland Canal route are proceeding. Water quality station 8 miles away at Wellandvale Ave., St.
<u>Biochemical oxygen demand:</u>	1.7	.52	.39	
<u>Total suspended solids:</u>	3.0	.21	.26	
<u>Fish Toxicity:</u>	Lethal	Non- Lethal	Lethal	
<u>Allowables:</u> M.O.E. TSS		0.36	0.35	
		0.36	0.35	
<u>Federal:</u> TSS		0.57	0.57	
(1971) BOD		0.64	0.64	

Catharines monitors all effluents from pulp and paper mills in the Niagara area. 1982 data - TSS 207; D.O. 11.8; total coliform 8,045; fecal coliform 901. Effluent TSS loading has often been 5 ppm; BOD₅, 35 ppm.

AIR EMISSIONS:

Mill is situated in the City of St. Catharines at the boundary with the Town of Thorold. There are no problems with neighbouring land users. Calculated 48 Mg/year NO_x from boilers. Boilers were converted to natural gas to reduce SO₂. Steam emissions were reduced due to use of dry paper machine. No ambient air monitoring is needed.

SOLID WASTES:

* Annual generation (megagrams): Clarifier sludge - 5,022
General rubbish - 900

ABATEMENT SYSTEMS:

Effluent is treated by a reactor clarifier and polishing ponds. Clarifier handles the total mill effluent; savealls, paper machines. New shower heads, new pulp chest, water conservation from use of dry paper machine are part of the abatement system.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada

LOCATION: Terrace Bay.
I.M.I.S. No: 0000830000

MILL HISTORY:

Construction/start-up date: 1948

The original mill had an initial design capacity of 320 megagrams per day. Production increased steadily to just under 400 megagrams per day. Planning for the new kraft mill started in the early 1970's and construction was initiated in 1975, increasing the design capacity to 1,135 megagrams per day. From the startup of the expanded mill in 1978 to the mill fire in October, 1981, the design capacity was not achieved. During the reconstruction after the fire, several operational changes were incorporated. Production increased steadily after the March, 1982 startup and it is presently close to design capacity.

Ownership:

The mill is owned by Kimberly-Clark U.S.A., headquartered in Wisconsin.

Processes/Products:

Logs and chips are converted by two kraft processes into bleached pulp.

Number of Employees: Mill: 1,044; Woodlands: 991.

ENVIRONMENTAL HISTORY: Receiving watercourse: Blackbird Creek.
Basin/watershed: Moberly Bay, Lake Superior.

The new kraft mill started up in 1978 and a Control Order was issued in 1979 to ensure that pollution abatement equipment was made operational. Extensive surveys of the plume and its zone of influence have been compiled by the Great Lakes Unit and confirm that aesthetic problems in Moberly Bay are associated with benthic perturbations, high phenolics concentrations and sediment accumulations of fibre. The plume has been detected at the Terrace Bay drinking water intake. The 1982 Control Order addresses discharges to receiving waters, atmosphere and land disposal sites.

PROSECUTIONS:

In 1981, the company was prosecuted successfully under the Ontario Water Resources Act for allowing the discharge of black liquor to the environment and for by-passing the clarifier with fines of \$2,500 and \$5,000 respectively.

EXISTING CONCERNS:

Blackbird Creek plus the associated small lakes system are so polluted from past discharge that they are now contributing to the contamination of Moberly Bay. The effluent is currently lethal to fish. Research is needed on the fate of chlorinated organics in the receiving waters.

Air emissions from the mill have resulted in numerous complaints.

FUTURE ACTIONS:

An intensive study of the effluent and Moberly Bay was underway in 1983 including the use of caged fish. A spill control system will be installed by the end of 1984.

FINANCIAL ASSISTANCE PROGRAMS:

No request was made for grants due to organizational and technical problems with both old and new kraft mills.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Kimberly-Clark at Terrace Bay.	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000830000
<u>PRODUCTION DATA:</u> T/d				Pulp yields are: 45% on softwood, 50-55% on hardwood.
<u>Pulping:</u> Bleached kraft pulping	381	785	1,135	
<u>Paper/other:</u> Sheet formation Bleached kraft pulp	381	785	1,135	
TOTAL	381	785	1,135	
<u>EFFLUENT DATA:</u>				Final TSS removal is by means of lakes in Blackbird Creek watercourse. Sanitary wastes are separated and treated by the mill. A 1981 final report of the receiving waters survey by the Great Lakes Section has not yet been published. Water quality station is at Highway 17: annual arithmetic mean - TSS 1,369.6, D.O. 5.0, BOD 170; annual geometric mean - total coliform 22,462, fecal
<u>Flow:</u> thousand cubic metres per day.	88.1	122.6	130	
<u>Biochemical oxygen demand:</u>	6.3	32.0	45	
<u>Suspended solids:</u>	2.9	6.58	8.5	
<u>Fish Toxicity:</u> LC50 - 96 hr. avg.		44% pH adjust	lethal	
<u>Allowables:</u> M.O.E. TSS		8.5		
BOD		45		
<u>Federal:</u> TSS		10.6		
(1971) BOD		28.2		
coliform 17,153.				

AIR EMISSIONS:

Particulates are emitted at 566 lb/hr; total reduced sulphur 12 ppm; sulphur dioxide, 820.6 lb/hr and nitrogen oxides, 121 lb/hr.
The MOE continuous TRS and wind monitor are located in town and are telemetered to the mill. The mill staff monitor Total Reduced Sulphur compounds (odour) quarterly. TRS and opacity are monitored continuously on #3 recovery and #4 power boiler. Air emission surveys were completed in 1980 and 1983.

SOLID WASTES:

Domestic waste is sent to the municipal landfill site; mill waste, to the company landfills (A591405; A591404). 80%-90% of the bark generated at the mill is burned in #4 power boiler.

ABATEMENT SYSTEMS:

Conventional air and water abatement equipment is used. The bleachery besides being countercurrent flow is designed for "closure". An extensive spill collection system will be installed by the end of 1984. Methods to reduce the discharge from the bleachery are being investigated. Spill control, recycle system and spill detection system will be installed.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: Kimberly-Clark of Canada

LOCATION: Terrace Bay.
I.M.I.S. No: 0000830000

HAZARDOUS CONTAMINANTS:

Water: Organics in the effluent are lethal to fish. Published research has found various bleachery waste streams to exhibit genotoxic and suspected carcinogenic activity.

Air: None evident, research is needed.

Solid wastes: Are not a problem.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Daily flow, Total Dissolved Solids, Total Suspended Solids, Biochemical Oxygen Demand and pH measurements are made. MOE auditing is done twice per month. Daily data is available to MOE.

Air: Continuous Total Reduced Sulphur compounds (odours) and opacity were measured on #3 recovery/#4 power boilers stack in September, 1983. Ability to do quarterly TRS tests started in September, 1983.

Solid wastes: are disposed in an approved landfill on company property. A power boiler handles approximately 80-90% of the bark and primary clarifier sludge (12-13 tonnes/hr.).

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: MacMillan Bloedel Limited,
Sturgeon Falls Division.

LOCATION: Sturgeon Falls.
I.M.I.S. No: 0001530005

MILL HISTORY:

Construction/start-up date: 1900

Formerly Abitibi Paper Company Ltd, Sturgeon Falls Division, the Mill was sold to MacMillan Bloedel in November, 1979. The Mill did not operate between 1930 and 1947.

Ownership:

MacMillan Bloedel, Canadian owned with headquarters in Vancouver, B.C.

Processes/Products:

Corrugating medium is produced by the neutral sulphite semi-chemical, NSSC, pulping process. An outdoor board is made using thermal refining.

Number of Employees: Mill: 385. (No woodlands operation.)

ENVIRONMENTAL HISTORY: Receiving watercourse: Sturgeon River.
Basin/watershed: to Lake Nipissing/Lake Huron

A November 1977 Control Order served on Abitibi-Price required control of suspended solids, phenol and BOD₅. An Amending Control Order, November, 1979, provided for a less stringent suspended solids requirement. The company is in compliance with phenol and suspended solids requirements.

The Amending Control Order required MacMillan to construct a storage lagoon by December 31, 1982, for high BOD spent NSSC liquor during low flow conditions in the Sturgeon River. A second amending control order was issued in November, 1982 to allow the company to investigate anaerobic treatment in place of the storage lagoon.

PROSECUTIONS:

The existing Amending Control Order requires that the company install the an anaerobic treatment system to reduce the BOD losses to the lowest practical level achievable, by March 1990.

EXISTING CONCERNS:

Whether or not the anaerobic treatment system will prove to be an economically and technically sound abatement solution. Other alternatives such as chemical recovery and aerobic treatment have been deemed by the company to be cost prohibitive.

FUTURE ACTIONS:

Development of high technology anaerobic treatment could have far ranging implications for economical treatment of high BOD waste streams in several industrial sectors; additional BOD removal and toxicity reduction will be required. Company has requested federal financial assistance to do anaerobic evaluation and design.

FINANCIAL ASSISTANCE PROGRAMS:

Abitibi-Price was awarded an incentive grant of \$1 million for facility improvement. A total investment of \$12 million will be made over 5 years. Modernization of the production facilities will cost \$7.3 million; \$3.8 million will go to pollution control. MacMillan agreed to the conditions of the Abitibi-Price grant.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

MacMillan Bloedel at Sturgeon Falls.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				Pulp yields: NSCC 85%, refiner 95%.
<u>Pulping:</u> neutral sulphite semi- chemical refiner pulp	203 147		219 105	
<u>Paper/other:</u> corrugating medium hardboard	204	194 84	225 100	
TOTAL	350	278	325	
<u>EFFLUENT DATA:</u>				High bacteria levels of <u>Klebsiella</u> and <u>Pseudomonas</u> have been identified. Mill effluent is toxic to fish. River below mill has been declared a fish sanctuary. Several tourist camps are located downstream of the mill. Extreme downstream dissolved oxygen depletion has been encountered during low flow summer conditions.
<u>Flow:</u> thousand cubic metres per day.	19.1	10.1	4.0	
<u>Biochemical oxygen demand:</u>	65.5	64.4	62.1	
<u>Suspended solids:</u>	10.1	1.7	below 2.9	
<u>Fish Toxicity:</u>		Lethal		
<u>Allowables:</u> M.O.E. TSS		2.8	2.9	
		BOD	2.9	*
<u>Federal:</u> (1971) TSS		2.7	3.2	
		BOD	7.5	8.8

Sanitary wastes are segregated and treated by the town. Phenol in effluent was due to phenolic resin used for hardwood manufacture. Effluent is discharged through a diffuser; no foam or odour problems exist.

* Company is required to maintain 47% Dissolved Oxygen saturation in the Sturgeon River at all times. Ultimately, MOE requirement is 10 Megagrams/day. Actual hardboard mill BOD is about 3 Megagrams/day and should be added to federal allowable.

AIR EMISSIONS:

Emissions have never been measured nor has an inventory been developed. Mill is situated in the town. Combustion emissions of particulate and sulphur dioxide are not monitored; however the mill has no history of air complaints.

SOLID WASTES:

Clarifier sludge is generated at the rate of 7 megagrams per day and is sent to a private landfill (not company owned). Wood residues are burned in the wood waste boiler. Company began purchase of Woodex pellets for boiler fuel in 1983.

ABATEMENT SYSTEMS:

- runoff of phenol from use of phenolic resin in hardboard mill is controlled by internal recycle.
- suspended solids are removed from the effluent by a storage tank/flotation clarifier system.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: MacMillan Bloedel Limited,
Sturgeon Falls Division.

LOCATION: Sturgeon Falls.
I.M.I.S. No: 0001530005

HAZARDOUS CONTAMINANTS:

Water: Clarifier effluent and spent liquor is toxic to fish.

Air: Unknown but none are suspected.

Solid wastes: Unknown but none are suspected.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Three effluent sewers are monitored - clean water, clarifier effluent and spent liquor as follows:

- flow - continuous monitoring, 24 hours
- phenols, weekly analysis of a sample made up of daily composites
- Total Suspended Solids daily 24 hour composite on each sewer
- Biochemical Oxygen Demand, daily 24 hour proportional composite made up from individual sewer composite. Effluent is audited by MOE once every two months. Difficulties are experienced with BOD analysis.

Air: No emission report is submitted.

Solid wastes: Mill maintains record of waste shipments sent to an approved private (municipal) landfill site. Mill clarifier sludge is utilized as cover material/soil conditioner at the landfill site.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Ontario Paper Company Ltd.

LOCATION: Thorold.
I.M.I.S. No: 0000930008

MILL HISTORY:

Construction/start-up date: 1913

The mill is unique in Canada in having an operational chemical recovery system with commercial by-products including ethanol (1943), vanillin (1952) and saltcake (1973), the latter from the Copeland process which concentrates and incinerates weak chemical wastes from the sulphite process. A major renovation and expansion has replaced five newsprint machines by two modern, high speed machines with TMP, CMP, sulphite and waste deinked newsprint feedstock. The aesthetic problem of Old Welland Canal is highly visible due to prime residential areas overlooking the Canal.

VANILLIN FROM MAINLAND CHINA HAS SEVERELY DEPRESS MARKET PRICE.

Ownership:

The mill is a wholly owned subsidiary of the Tribune Company of the U.S.A., a privately owned holding company with diverse interests including the Chicago Tribune and the North Shore Paper Company, Province of Québec. Ontario Paper's headquarters are in St. Catharines, Ontario.

Processes/Products:

Newsprint is made from logs by Thermo Mechanical, Sulphite and chemical-mechanical pulping and with the addition of deinked old newspapers. Speciality chemicals, vanillin and alcohol are produced from sulphite liquor. Hardwood is used for chemi-mechanical pulping; softwood, thermo-mechanical and sulphite pulping.

Number of Employees: Mill: 896.

ENVIRONMENTAL HISTORY: Receiving watercourse: Old Welland Canal.
Basin/watershed: via a syphen into the Old Welland Canal, to the Second Canal and thence to Twelve Mile Creek and Lake Ontario.

Past program approvals/control orders were the basis of negotiated solutions to mill problems of smoke, SO₂ and odours. Prime residential areas overlook the canal and plans are proceeding for park and recreation development along the canal route. Due to the nature of the problem and aesthetic impairment in a sensitive area, Best Practicable Technology has been required. Company is striving to meet Control Order requirements.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Operational problems have been experienced during the transition from the old pulping processes and paper machines to their replacements. Sewer losses increased in 1982 from 1981 levels resulting in an exceedance of the June 30th, 1983 suspended solids limit. Some foaming problems remain. There is also concern with odour emissions from the Chemical Recovery Plant and SO₂ from the Acid Plant and Digester blow stack.

FUTURE ACTIONS:

A new Control Order is under development. Better control of foam and colour in the effluent is required. Improved containment and treatment of spills during scheduled shutdowns are essential.

FINANCIAL ASSISTANCE PROGRAMS:

The provincial government provided \$21.3 million and the federal government \$10.7 million of a \$32 million grant to Ontario Paper for a \$211.7 million renovation program. A 77,500 megagrams per year deinking waste news plant is included. Pollution abatement has cost \$20 million as part of this modernization.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Ontario Paper Company Ltd.

LOCATION: Thorold.
I.M.I.S. No: 0000930008

HAZARDOUS CONTAMINANTS:

Water: High bacteria counts of Klebsiella pneumoniae and Pseudomonas aeruginosa are found in the Old Welland Canal. Sources are being identified by West Central Region staff in 1984.

Air: Organic compounds are found in the emissions from the Copeland Reactor, (Chemical Recovery Plant).

Solid wastes: No indication of waste being hazardous. Lime grits are slaked before being sent to landfill.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Four sewer discharges are combined into a single effluent from the mill. Continuous flow measurement is used for three sewers. The fourth is determined by difference over the intake water. Sewers are sampled automatically for BOD₅ and Dissolved Solids, tests are performed three times per week. Suspended solids are measured on daily composites. Compositing samples are combined proportional to sewer flows to yield combined effluent values. MOE effluent audit samples are taken once per month.

Air: The SO₂ emission from acid plant stack is continuously monitored and recorded on a strip chart in the Control Room. MOE's SO₂ ambient monitor is located off-company property and it is telemetered to the acid plant Control Room.

Solid wastes:

Clarifier Sludge: to landfill 69,564 Megagrams/year
 to Domtar recycle 1,379 Megagrams/year
 to soil conditioner 1,720 Megagrams/year

General Mill Wastes: to own (MOE approved) landfill 300 Megagrams/year
 to Walker Brother's Quarry landfill 12,429 Megagrams/year.

All material sent to landfill recorded by waybill.

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DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Ontario Paper at Thorold.	1970	1982	1984	Comments
	Megagrams/day		Forecast	
<u>PRODUCTION DATA:</u>				
Wood		560	703	<u>Pulping Yield</u>
<u>Pulping:</u>				
sulphite	144	142	139	sulphite 48%
thermo-mechanical		99	291	thermo mechanical pulping 90%
deinked waste news		82	174	chemi-mechanical pulping 90%
chemi-mechanical		0	102	deinking 84%
stone groundwood	580	128	shutdown	
<u>Paper/other:</u>				1982 was not a representative year for pulping or production.
newsprint	724	408	716	
(industrial alcohol)		12,5001		The mill was in the transition from the old to the new facilities.
(vanillin products)	(6.0)	(6.5)		
(salt cake)	-	(144)		
sulphite pulp sale		63	NIL	
TOTAL	724	471		3 Megagrams/day of lignin are also produced.
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	101.9	127.8	120 est.	Bacteria, nutrients, metals (scan), sulphites, phenols are measured at the water quality station, Wellandvale Ave. in St. Catharines. Station monitors all pulp/paper mills in Niagara area.
<u>Biochemical oxygen demand:</u>	58.2	14.8	11.8	1982 data - TSS 207; D.O. 11.8; total coliform 8,045; fecal coliform 901.
<u>Total suspended solids:</u>	13.2	9.6	6.3	Effluent passed toxicity test in 1981 before mill modernization and expansion.
<u>Fish Toxicity:</u>	Lethal	To be done		
<u>Allowables:</u> M.O.E.				
TSS		6.8	6.8	
BOD ₅		18.14	18.14	
<u>Federal:</u> (1971)				
TSS		6.1	9.3	
BOD		25.8	33.2	

A paper break on the new machines usually shows up as high TSS concentrations in effluent.

AIR EMISSIONS:

Calculated emissions in megagrams per year from combustion are sulphur dioxide - 31.8 and oxides of nitrogen - 353. Sulphur dioxide emissions (measured) is 811 megagrams per year from digester. Noise, visible emissions, dust or odours are immediately noticeable. Continuous Ministry monitoring of SO₂ impingement outside of fence at Niagara Falls Road. Abatement Equipment: Regenerative Acid Cooling; Large Digester Relief Lines; Spray Sulphur Burner; Sulphur Dioxide Clean-Up Tower; W.T.P. Dust Control System; Dust Vacuum System; Rotocyclone Scrubbers. Sulphur dioxide and odorous compounds emitted from sulphite digesters; NO_x emitted from natural gas fired boilers. Complaints have been made about odours from the Copeland Reactor Stack - smells like creosote.

SOLID WASTES:

For the year 1983, megagrams of waste were 72,663 of effluent treatment solids and 12,429 of general garbage. 96% of the wet sludge with an 80% moisture content are sent to Walker Brother's Quarries along with general mill wastes. 4% of sludge is used by farmers as a soil conditioner.

ABATEMENT SYSTEMS:

The effluent Waste Treatment Plant including chemical recovery has significantly reduced foam and colour except for spills and malfunctions. It comprises primary clarification, sludge, mud and lignin handling, containment facilities and the UNOX oxygenated activated sludge system. Chemicals recovered are alcohol, vanillin and saltcake. Copeland system incinerates raffinate and excess liquor wastes from Waste Sulfite Liquor and the alcohol plant. An ion exchange plant recovers sodium. Spill controls are operated by staff trained in start up and shut down procedures. Sewer separation to prevent loss of 'dirty' wastes continues. 1981 UNOX secondary treatment system treats deinking effluent. However, the foaming problem with the effluent from the new deinking mill is still to be resolved. A filter is to be used to remove residual detergents from the deinking effluent as a foam reduction measure. Shutdown, boilouts, clarifier repairs, etc. are easily detected in effluent.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Spruce Falls Power and Paper Co.

LOCATION: Kapuskasing.

I.M.I.S. No: 000134009

MILL HISTORY:

Construction/start-up date: 1920/1922

The mill began operations with a calcium sulphite mill in 1922; this process was shutdown in 1982. In 1928, the groundwood and newsprint mills started production. In 1964, a new mill, Magnefite, was constructed. Magnefite is a magnesium sulphite mill which has spent liquor recovery. Two 200 ton/day thermal mechanical pulp mill was started up in 1976 and expanded to 360 tons per day in 1981. The adjacent Kimberly-Clark tissue mill was closed in 1983. The company operates two dams on the Kapuskasing and Mattagami River.

Ownership:

The company is a subsidiary of Kimberly-Clark Corporation (50.5%) and the New York Times (49.5%).

Processes/Products:

An integrated mill which makes newsprint from logs and chips by using stone groundwood, thermal mechanical and magnefite sulphite (magnesium sulphite) processes. A repulper has been installed so that purchased pulp can be used.

Number of Employees: Mill: 1,200; woodlands: 400.

ENVIRONMENTAL HISTORY: Receiving watercourse: Kapuskasing River
Basin/watershed: James Bay

River driving logs to the mill has resulted in heavy bark deposits up-stream of the mill. The calcium sulphite mill was shut down November 1982. As required by the current Control Order, BOD has been reduced about 80%. During summer, river flow may be extremely low.

Control Order: Issued March 28, 1977; amended, 1982; and target date: December 31, 1984.

PROSECUTIONS:

None.

EXISTING CONCERNS:

Achieving BOD discharge limits as set in the current Amending Control Order to meet the dissolved oxygen criteria.

FUTURE ACTIONS:

Upstream effects of the log drive to the mill are being evaluated. Effluent should pass the fish toxicity test.

FINANCIAL ASSISTANCE PROGRAMS:

A grant of \$7 million was received from Canada and Ontario and are part of the company's \$61.6 million modernization program.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Spruce Falls and Paper at Kapuskasing	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 000134009
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u>				
Calcium sulphite	263	165	shutdown	Calcium sulphite 43%
Magnefite	150	143	142	Magnefite 50%
Groundwood	633	395	448	Groundwood 94%
Thermal Mechanical	--	335	320	Thermal Mechanical 92%
Purchase kraft and pulp	--	4	14	
<u>Paper/other:</u>				
newsprint	837	942	980	
sulphite pulps	209	--	--	
TOTAL	1,046			
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	170.6	100	90	Shutdown of calcium sulphite in 1982 improved effluent by reducing BOD load.
<u>Biochemical oxygen demand:</u>	127.2	76	30	
<u>Suspended solids:</u>	106.9	10	8	
<u>Toxicity:</u>	Fails	Fails	-	
<u>Allowables:</u> M.O.E. - TSS		13	13	
- BOD		40/30*	40/30*	
<u>Federal:</u> (1971) - TSS			13	
- BOD			30	

Dissolved oxygen studies (assimilative capacity) studies were made for the river in 1977 and 1983*. The current Control Order sets BOD levels of 40/30 megagrams per day; the 30 applies to low flow summer conditions. To meet the 47% dissolved oxygen minimum, the BOD limit is 12 megagrams per day. During May to September, a dissolved oxygen meter and a thermometer in the river are operated by the mill.

AIR EMISSIONS:

The mill is a source of oxides of nitrogen, particulate, sulphur dioxide and odours and needs to be investigated further. Wood residue burner violates opacity when woodwaste mixture (dry/wet) is not uniform. Emissions from coal burning units have been the source of complaints. MOE has six sulphation plates, four dustfall jars and a vegetation surveillance program. Odours are detected in Kapuskasing from the Magnefite mill.

SOLID WASTES:

Clarifier sludge is dewatered and burned with bark in three wood residue boilers. Landfill has been approved by MOE.

ABATEMENT SYSTEMS:

To meet air and water improvements, both process changes and conventional air and water abatement equipment have been installed. This is the only clarifier shed enclosure in Canada. Thus scum removal is operational all year. A centralized broke and whitewater system was installed. Innovative work on washing of mechanical pulp is underway which may be an alternative to secondary treatment. Clarifier sludge is dewatered and burned. Sanitary wastes are segregated and treated by the company and the municipality.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Spruce Falls Power and Paper Co.

LOCATION: Kapuskasing.
I.M.I.S. No: 000134009

HAZARDOUS CONTAMINANTS:

Water: Effluent needs to be evaluated for trace organics with respect to long term effects.

Air: No problem is evident.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Effluent is composited by a flow proportional sampler. Daily determinations are made of TSS, BOD, pH, flow, COD, TDS and conductivity. TSS limit is based on a weekly average; BOD limit, a 30 day average. The Leopold-Lagco flume, which measures flow is calibrated monthly; an annual independent check is made of the calibration. The TSS and BOD analyses are by approved CPPA and MOE methods. Monthly effluent quality and production rate reports are sent to MOE.

Air: No reporting and/or analytical requirements.

Solid wastes: Development of a new municipal waste disposal site may preclude use of the present landfill site on company property due to its proximity to the river and 95% municipal type refuse composition.

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STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: St. Mary's Paper Inc.
(formerly Abitibi-Price Inc.)

LOCATION: Sault Ste. Marie.
I.M.I.S. No: 0000860304

MILL HISTORY:

Construction/start-up date: 1898

Originally, this mill produced newsprint on four paper machines using hydraulic groundwood and sulphite pulp. Major process changes through the years included an electrically driven groundwood mill in 1954, a switch to the manufacture of groundwood specialty paper (i.e. catalogue, directory, roto gravure) in 1955-56, a decommissioning of the sulphite mill and subsequent purchase of kraft pulp from Abitibi's Smooth Rock Falls Division in 1971-72 and the shutdown of #2 paper machine in 1984. In 1984-85 clay will be continuously added to all grades of paper and a super calender will be installed on each machine to permit a further diversification of groundwood specialty paper products.

Ownership:

On June 1, 1984, Abitibi-Price Sault Ste. Marie Division was sold, and the name was changed to St. Mary's Paper Inc., a wholly owned subsidiary of D. C. Northshields Holdings Inc., Toronto, which is in turn equally owned by D. C. Northland Inc., Indian Head Park Ill., and by Shielding Investments of Toronto. Mr. Dan Alexander is the consortium's president.

Processes/Products:

Groundwood specialties, paper products are made by combining groundwood pulp from stonegrinding softwood logs and purchased kraft pulp.

Number of Employees: Mill: 485; Woodland: 150

ENVIRONMENTAL HISTORY: Receiving watercourse: St. Mary's River
Basin/watershed: International watercourse in Great Lakes Basin.

Environmental studies conducted by the OWRC in the early 1960's showed elevated levels of BOD₅ and TSS entering the St. Mary's River from Abitibi's mill. The closure of their sulphite mill in 1971-72 and many implant modifications led to an improvement in effluent quality. In 1974, under a Requirement and Direction, Abitibi were committed to install primary treatment facilities to meet Ministry effluent objectives. These efforts failed to achieve compliance, and in 1980, a Control Order was served.

In 1984, as a condition of purchase, St. Mary's Paper received undisclosed Federal and Provincial financial assistance.

PROSECUTIONS:

None.

EXISTING CONCERNS:

Emission from the Dutch ovens boilerhouse continuously violates Ministry regulations. A new combustion fan, controls, etc. with a baghouse are required; estimated cost is \$800,000 to \$2,000,000.

FUTURE ACTIONS:

A Control Order is currently in preparation. It is to be in agreement with the recommendations in the Control and Monitoring Requirements for Ontario pulp and paper mills.

FINANCIAL ASSISTANCE PROGRAMS:

The mill's former owners Abitibi-Price Inc. submitted a capital expenditure for seven of eight mills in Ontario, for \$196 million of which \$9.2 million was for Sault Ste Marie. The Sault Ste. Marie mill was allocated \$2.3 million for environment and \$6.89 million for productivity. A grant of \$15 and \$7.5 million was received from the Provincial and Federal governments respectively.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

St. Mary's Paper Inc. Sault Ste. Marie	1970 Megagrams/day	1982	1984 Forecast	Comments I.M.I.S. No: 0000860304
<u>PRODUCTION DATA:</u>				
<u>Pulping:</u> purchased pulp stone groundwood sulphite	- 207 104	60 267 Shutdown	68 228	Pulp yield from groundwood is 95%.
<u>Paper/other:</u> groundwood specialties	314	327	296	
TOTAL	314	327	296	
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	74.4	32	30	*Effluent passed fish toxicity test of May 16, 1983. TSS was reduced to 4.0 megagrams per day by the new clarifier early 1983. Water quality station is at civic centre, Sault Ste. Marie; 1982 annual arithmetic means are - TSS 68; BOD 11.3.
<u>Biochemical oxygen demand:</u>	31.6	6.3	5.2	
<u>Suspended solids:</u>	17.7	12.0	2.8	
<u>Toxicity:</u>	Fail	Fail*		
<u>Allowables:</u> M.O.E. TSS		4.8	4.8	
BOD		5.3	5.3	
<u>Federal:</u> (1971) TSS		5.7	5.7	
BOD ₅		8.2	8.2	

River assessment surveys have not been made to determine the effects of Abitibi-Price's effluent; effluent from steel mill dominates. A recently installed diffuser discharges the effluent which does not cause foam, oil, BOD or phenol odour problems.

AIR EMISSIONS:

The mill is located in an industrial area dominated by Algoma Steel. The mill uses natural gas, some coal and wood waste as fuel. Combustion emissions of particulates and oxides of nitrogen have never been measured. Smoke from waste wood fired boiler violates the objection of 20% opacity; mean opacity is 50%.

SOLID WASTES:

Flyash is sent to an approved private landfill: approximately ten truckloads a month.

ABATEMENT SYSTEMS:

Bark screens and drainer, bark fines recovery system and disc filters on paper machine waste waters were installed to reduce TSS. The original undersized flotation unit was replaced by a clarifier, scum collection devices and a submerged outfall in 1983. There are cyclones on the wood fired boilers to collect particulate.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

NAME: St. Mary's Paper Inc.
(formerly Abitibi-Price Inc.)

LOCATION: Sault Ste. Marie.
I.M.I.S. No: 0000860304

HAZARDOUS CONTAMINANTS:

Water: None expected.

Air: No known problem.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ ANALYTICAL REQUIREMENTS:

Water: Effluent is composited by a timed automatic sampler which is not flow proportioned. Flow is measured by a Parshall flume which was calibrated in 1983 and found to read 15% too high. ISS are done daily; BOD₅, one per week on a composite sample. C.P.P.A. analytical methods are used. MOE audit sample is taken quarterly. Voluntary monthly effluent report consists of monthly averages for flow, ISS, BOD and saleable production.

Air: A dustfall and hi-volume sampler network was established by MOE in the area adjacent to the mill primarily to monitor emissions from the steel mill. There are no in-stack analyzers and thus no emission reports.

Solid wastes: Most of the bark and wood waste is burned; leftover residues are sent to a private landfill along with the ash from the wood fired boilers. Mill does not report quantity sent to landfill.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Strathcona Paper

LOCATION: Strathcona.
I.M.I.S. No: 0001740000

MILL HISTORY:

Construction/start-up date: 1872

The mill was built in 1872 and used neighbouring forests as source of logs. Since the area's forest resources have been completely depleted, the mill now relies on wastepaper as furnish.

Ownership:

Finlay family bought the mill in 1902. Roman Corporation Limited purchased the family-owned enterprise in November 1974. The Strathcona Paper Company now operates as a division the Roman Corporation.

Processes/Products:

The paper making process derives its pulp from wastes paper. Much of the ink is removed by pulp cleaners/screens. The process takes place on eight cylinders at the wet end for the forming of the paper sheets consisting of eight layers of fibre. The product consists of box board in grades of folding and non-folding categories which are produced in thickness ranging from 450 micrometers to 1150 micrometers to a maximum width of 2900 millimeters. Cation starch is added in two stages. Latex polymer is also used to dress the outside layer. The finished product is used in display boards, dry cereal boxes, clothing boxes, book match splints, coloured gift boxes, shoe boxes, office files, greeting cards, carry out food trays, and etc.

Number of Employees: Mill: 210.

ENVIRONMENTAL HISTORY: Receiving watercourse: Napanee River.
Basin/watershed: via Bay of Quinte to Lake Ontario.

Mill installed settling and aeration lagoons. A river study in 1975 established the assimilation capacity with reference to BOD₅ loading objective from the plant. A Requirement and Direction was issued in 1976. The 1976 Requirement and Direction set a limit of 204 kilograms per day of BOD₅ between May 15 and October 15. The remainder of the year, BOD₅ is geared to flow in the river. BOD₅ loadings to the Napanee River are not dictated by a table of River Flows vs. Max. BOD₅ Loadings as set out on C of A #4-021-80-006 dated September 4, 1980 (BOD₅ Loadings range between 204 and 613 kg/day for river flows between 1.2 and 3.45 m³/sec.). In June 1983, the mill installed mechanical aerators to reduce odours and BOD₅ in the effluent.

Flow in the Napanee River varies from approx. 1 m³/sec. to 40 m³/sec.: flooding in the spring of 1983; very low flow in the summer of 1983. Boaters use the river during the summer. The average plant discharge to the River is approx. 0.03 m³/sec.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Monitor that the mill complies with the BOD₅ limits as a function of River flows as stated in the Certificate of Approval. Solids from the lagoons are being investigated for reuse. Increased water recycling is being studied. Potential odour problems from the lagoons are of concern to the MOE.

FUTURE ACTIONS:

Audit that effluent BOD₅ loading is in compliance with C of A conditions. Long term objective is an additional clarifier or saveall to reduce solids to lagoons.

FINANCIAL ASSISTANCE PROGRAMS:

No grant was requested.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Strathcona Paper at Strathcona.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
Purchased pulp and selective wastepaper are used.	82.5	121.6	200	Virgin pulp used for toplineer when required brightness is 80+. Wastepaper (tab cards, white envelopes, hard whites) are brought from Montréal, Toronto and Ottawa. Newspaper is pulped for the inner layer.
Specialty paper boards.	82.5	121.6	120	
<u>EFFLUENT DATA:</u>				
Flow: thousand cubic metres per day.	4.0	3.3		Toxicity was to be measured in 1983. Water quality station is down- stream at Federal flow gauge.
Biochemical oxygen demand:	.18	.47	.47	1982 data is - BOD 1.0;
Total suspended solids:	.18	.04	.10	D.O. 10.3 milligrams/litre. (annual arithmetic mean)
Fish Toxicity:	Lethal	Lethal		
Allowables: M.O.E. - BOD ₅		0.2*	0.2*	* Maximum discharge between May 15 and October 15.
Federal: (1971) - TSS		2.1	2.0	
- BOD ₅		0.9	0.9	

AIR EMISSIONS:

The mill is a source of oxides of nitrogen, steam and sulphur dioxide. Residential buildings are located within 100 m. of the plant (community of Strathcona). No complaints concerning air emissions were received by MOE during 1983. Air monitoring equipment is to be installed near the site to further investigate potential problems.

SOLID WASTES:

Lagoon is dredged annually with the solids being pumped to a separate sludge holding lagoon. The solids dry into a hard insoluble state. Company is investigating possible re-use of the sludge.

ABATEMENT SYSTEMS:

The first saveall (1600 holes per square inch) wire mesh was installed in 1948. Seven sedimentation and aeration lagoons were installed between 1972-75. These lagoons are operated in series. During summer, treated effluent is used to irrigate adjacent land, 60 acres. Excess water is drained back through the collection system and discharged to the River. A Krofta clarifier was installed in 1980. This is used to support water recycling within the plant. In 1983 10 aerators, total horsepower of 90 (2-25 HP, 8-5HP), were installed to reduce odours and BOD.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Strathcona Paper

LOCATION: Strathcona.
I.M.I.S. No: 0001740000

HAZARDOUS CONTAMINANTS:

Water: Waste paper might contain PCB's. No PCB's were found in the effluent sampled June 1983.

Air: No air emission complaints were received during 1983. However, odours from the effluent treatment lagoons have been noted by MOE staff during the summer months.

Solid wastes: No problem is evident.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Flow, TSS and BOD₅ are monitored by the mill grab samples once per week from each of the two outfalls and from spray irrigation field runoff systems. MOE takes audit samples at random times during the year. Company fabricated flow weir to MOE design.

Air: Emissions of combustion gases and steam are insignificant. Air monitoring equipment is to be set up adjacent to the site.

Solid wastes: No report was submitted or required.

STATUS REPORT

ONTARIO PULP AND PAPER INDUSTRY

NAME: Trent Valley Paperboard Mills

LOCATION: Glen Miller.

I.M.I.S. No: 0001750009

MILL HISTORY:

Construction/start-up date: 1880

The East Mill had originally used straw and rags to make paperboard; to-day the furnish is wastepaper. In 1976, a new West Mill was built which incorporated modern recycle and screening technology. The East Mill is now in full time operation. New mill management took over in 1980 due to a severe financial crisis.

Ownership:

The Miller Brothers Company (1963) Limited sold this mill to Paperboard Industries Corporation, a private firm located in Ottawa. By year end 1984, private funds will replace government loans since the operation has been made profitable.

Processes/Products:

Selective waste paper is used to make boxboard and paperboard. The mill removes impurities like plastics and paper additives mechanically: lights, pulp and heavies. The latest papermachine can make a six layer paperboard.

Number of Employees: Mill: 279.

ENVIRONMENTAL HISTORY: Receiving watercourse: Trent River.

Basin/watershed: via Bay of Quinte to Lake Ontario.

The mill was issued a requirement and direction in 1976 to reduce TSS when the mill was expanded. Since the Trent River had adequate BOD₅ assimilative capacity, the effluent improvement program has emphasized solids removal. Mill had increased water recycle and installed screening to reduce solids by 1975. A Requirement and Direction was issued September 1976 to limit the discharge of suspended solids from the East Mill to 272.4 kilograms per day. In 1983, mill operated for several days with no effluent discharge.

PROSECUTIONS:

No prosecutions.

EXISTING CONCERNS:

Recently pulp has been discharged to the Trent River because of improper water balancing. In-mill changes are being made by the company to resolve this problem.

FUTURE ACTIONS:

FINANCIAL ASSISTANCE PROGRAMS:

No grant was requested.

DATA SUMMARY SHEET:
ONTARIO PULP AND PAPER INDUSTRY

Trent Valley Paperboard at Trent Valley.	1970 Megagrams/day	1982	1984 Forecast	Comments
<u>PRODUCTION DATA:</u>				
Purchased wastepaper - corrugated, kraft, boxboard, newspapers, flyleaf, etc - is pulped.	70.7	259.9	301	Different wastepaper grades are segregated so that the outside layer has less impurities.
Paperboards (total production)	70.7	253	286	A paperboard up to 6 plies to a maximum thickness of 0.052 inches is made on the paper machine. Cation starch is added for strength (only on No. 3 machine). Pulp yield is 95%
<u>EFFLUENT DATA:</u>				
<u>Flow:</u> thousand cubic metres per day.	12.74	1.58	*3.25	The water quality station is at the bridge in Trenton; the 1982 annual arithmetic average for D.O. is 9.3.
<u>Biochemical oxygen demand:</u>	.09	.26		
<u>Total suspended solids:</u>	1.63	.26		
<u>Fish Toxicity:</u>			*0.88	The average flow rate is meaningless since discharge is sporadic; attempt is being made to run the mill at zero discharge. The lowest TSS concentration on record is 8-10 ppm.
<u>Allowables:</u> M.O.E. - TSS		0.28	Total	
			0.816	
Federal: (1971) - TSS		1.8		
- BOD		1.8		

* Accuracy of flow measurement and sampling is being questioned.

AIR EMISSIONS:

The mill is an insignificant source of combustion gases and steam. The highway divides the mill property; the newest mill is on the west side; the old mill, on the east side next to the river. The company owns 86 acres and a dam on the Trent River. The dam will be used to produce electricity.

SOLID WASTES:

In 1982, undesirable wastes (contamination - dirt, plastics, etc.) received with "clean" wastepaper were 6.9 megagrams. In September 1984 three Noss forward cleaners and 200 Beloit reverse cleaners were put into commission for cleaning of wastepaper stock. "Lights" and "heavies" are removed from the furnish. This material is disposed of at the Quinte Sanitation Services' landfill site in Sidney Township.

ABATEMENT SYSTEMS:

TSS are reduced by in-plant control that is screening and recycle. Whitewaters must be segregated because different paperboards are made. A saveall clarifier has been installed at the East Mill. Two Krofta clarifiers were added in 1982.

STATUS REPORT
ONTARIO PULP AND PAPER INDUSTRY

NAME: Trent Valley Paperboard Mills

LOCATION: Glen Miller.
I.M.I.S. No: 0001750009

HAZARDOUS CONTAMINANTS:

Water: No problem is evident.

Air: No problem is evident.

Solid wastes: No problem is evident; material upon drying becomes stable.

MONITORING/REPORTING/ANALYTICAL REQUIREMENTS:

Water: Mill analyzes the final effluent for Total Suspended Solids and Total Dissolved Solids daily. MOE audit sample is collected randomly.

Air: A report is not required: insignificant air emissions.

Solid wastes: No report is necessary.